SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK
Index No. 110953/96

SHARLENE HOBERMAN and AUDREY HULSE, as executrix, on behalf of the Estate of Lewis Hulse, individually, and on behalf of others similarly situated,

Plaintiffs,

- against -

BROWN & WILLIAMSON TOBACCO CORPORATION, B.A.T. INDUSTRIES P.L.C., BATUS, INC., BATUS HOLDINGS, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), and TOBACCO INSTITUTE, INC.,

Defendants.

Deposition of:

EDWARD SANDERS

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK
Index No. 110950/96

ROSE FROSINA, ELIZABETH COLAVITO and ANILDA ROSS, individually, and on behalf of others similarly situated,

Plaintiffs,

- against -

PHILIP MORRIS, INC., PHILIP MORRIS COMPANIES, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC.,

Defendants,

Property of: Ness, Motley
Main Pl File Room
Charleston, SC

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SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK
Index No. 110952/96

CATHERINE ZITO, PETER HOBERMAN and GEORGE ELISSEOU, individually, and on behalf of others similarly situated,

Plaintiffs,

-against-

THE AMERICAN TOBACCO COMPANY, INC., AMERICAN BRANDS, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC.

Defendants.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA
CIVIL ACTION No.96-5903-CN

BARNES et al,

Plaintiffs,

v.

THE AMERICAN TOBACCO COMPANY, et al.

Defendants.

TRANSCRIPT of testimony taken before ROBERT E FREEMAN, MBIVR, Certified Court Reporter at the offices of Titmus, Sainer and Deckert, 2 Sergeant's Inn, London EC4, England on the 15th day of August, 1997, commencing at 1028 a.m.

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APPEARANCES:

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Videographer: Richard Goodaire

Reported by: Robert Freeman

I N D E X

WITNESS	DIRECT	CROSS
DR EDWARD SANDERS		
MISS BRACHTL	6	
MR NUNLEY		244

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MR NUNLEY: Good Morning. This is Chip Nunley on behalf of the Defendant Philip Morris Incorporated in both the Arch case and the State of New York cases.

MR SHUB: Jonathan Shub, counsel for Plaintiffs in Arch for Barnes.

MISS BRACHTL: This is Martis Brachtl from Goodkind Labaton in New York City representing Plaintiffs in the New York action. I am taking this deposition both for use in the New York action and in the Pennsylvania action. To the extent that testimony is elicited in this deposition that is relevant to one but not the other of those actions Defendant's counsel have the right to seek to exclude that testimony as they deem appropriate. Are we ready?

MR NUNLEY: I think the one thing I would say is that we had a discussion before the deposition started concerning confidentiality. Previously in all the Arch cases we have had an agreement between Mr Shub and myself on behalf of the parties that depositions taken would be held confidential for 30 days following the deposition. I would ask for the same agreement to cover this deposition. I understand Mr Shub is happy to give

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that for purposes of Arch, and I don't know what your position is with respect to the State cases in New York.

MISS BRACHTL: In regards to the New York State cases we will be bound by the provisions of the confidentiality agreement there. May we proceed?

MR NUNLEY: Since I don't know what that confidentiality agreement looks like I'm going to tell you now, in case I forget at the end, that we will claim the deposition at least confidential until I have a chance a written transcript.

MISS BRACHTL: May we begin?

(Counsel nodded assent)

DIRECT EXAMINATION:

BY MISS BRACTYL:

Q. Good morning Dr Sanders?

A. Good morning.

Q. Have you had your deposition taken before?

A. No, I have not.

Q. I am sure your counsel has gone over some ground rules with you. Let me just tell you that the court reporter here is recording

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every word that I say, every word that you say, every word that anyone in the room says. If you don't understand my questions please say so and I will rephrase them. You need to do that because if you answer the question I have asked the persons who read the transcript are going to assume that you understood my question. Do you understand?

A. Yes, I do.

Q. If at any time you would like to take a break, you just let us know. Is that all right?

A. That's fine.

Q. Tell us your age, sir.

A. I am fifty -- I'm going to have to think about that. I'm 56.

Q. Thank you. Apparently we neglected to swear you in so we need to start over again.

(Witness sworn)

What is your current address, sir?

A. My current address is [DELETED]

Q. Are you currently employed by Philip Morris?

A. Yes, I am.

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Q. What is the name of the entity that employs you currently?
A. The Swiss entity, Fabriques de Tabac Reunies.
Q. Because my French isn't as good as yours may I refer to that as FTR----
A. Yes, you may.
Q. ---for the purposes of this deposition? Thank you. Your business offices are located at?
A. Business offices are located in Neuchatel.
Q. And may we have an address, please?
A. I think the address is 2000 Quai de Jean Renaux. We never use the address.
Q. Do you currently smoke?
A. Yes, I do.
Q. When did you begin smoking?
A. When I was 12 years old.
Q. Have you smoked consistently since then?
A. Yes, except for the three times when I attempted to give it up.
Q. Just tell me generally about your smoking history. What I'm interested in is chronologically what brands you smoked and

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generally how much you smoked?
A. I don't remember what I started out with because I usually smoked other peoples. When I started buying I started with Kent cigarettes. I then switched to Camels. I then switched to something I have forgotten. I then switched to Belle Aire. I smoked Alpine and then Merit, then Merit Ultra Light and then finally Merit Ultima or its European equivalents.
Q. When did you begin smoking Merits?
A. Don't remember exactly. It would have been sometime in the 1980s.
Q. At some point did you become a regular smoker.
MR NUNLEY: Objection as to form, and vague. Could you define what you mean by "regular smoker"?
MISS BRACHTL: He can answer it.
THE WITNESS: Well what do you mean by regular smoker?
BY MISS BRACHTL:
Q. Okay, do you smoke a pack a day?
A. I smoke more than a pack a day.
Q. When did you begin smoking a pack a day?

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A. When I was in college.

Q. And have you consistently, since college, smoked at least a pack a day except for periods when you quit?

A. Yes.

Q. You smoke more than a pack a day now?

A. Yes.

Q. How much do you smoke now?

A. About two to three packs a day.

Q. You mentioned that there were three times during your smoking history when you quit smoking. Please tell when those times were and for how long you quit during each time?

MR NUNLEY: Objection, compound. You can answer Dr Sanders.

THE WITNESS: The first time was when I was in college and the reason I quit was because my father threatened to throw me out of the house, and then the second time about the time I graduated college for the same, not the same reason exactly but again pressure from my parents; and then the third time when I was in graduate school and again pressure from my parents.

BY MISS BRACHTL:

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Q. Have you ever tried to quite since graduate school?
A. No.
Q. Are you married, sir?
A. No.
Q. Have you been married?
A. Excuse me; technically I am still married because the divorce is not final. I am going through a divorce. Yes, I have been married.
Q. When did that marriage begin?
A. That marriage began in 1985.
Q. And did the woman whom you married in 1985 smoke when you married her?
A. Yes.
Q. How much did she smoke?
A. I would imagine about a pack a day.
Q. Were you married before you married in 1985?
A. Yes.
Q. How long did that prior marriage last?
A. 7 years.
Q. Did that wife smoke?
A. Yes.
Q. And were you married before that

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marriage?
A. Yes.
Q. How long did that earlier marriage last?
A. 7 years.
Q. Did that wife smoke?
A. No.
Q. Were you married before?
A. No.
Q. Thank you. Do have you any children?
A. I have two stepdaughters but no children of my own.
Q. And those are the daughters of which wife?
A. The third one.
Q. Was there a time when those stepdaughters lived in the house with you?
A. Yes.
Q. How old are those stepdaughters today?
A. 22 and 25.
Q. Have either of those stepdaughters smoked?
A. Yes.

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Q. The 25 year old, when did she begin smoking?

MR NUNLEY: Objection, foundation.

BY MISS BRACHTL:

Q. You can answer questions unless your attorney tells you not to answer?

A. I don't really remember exactly.

Q. For how many years that you are aware ever did she smoke cigarettes?

A. She's 25 now; I would say about 6 or 7 years.

Q. During that 6 or 7 years did she generally smoke at least a pack a day?

A. She smokes less than a pack a day.

Q. And the 22 year old, did she smoke?

A. Yes.

Q. Can you tell me, to the best of your knowledge, when she began smoking.

A. I think when she was about 17 or 18.

Q. Did you ever tell either of those stepdaughters that they shouldn't smoke?

A. No.

Q. Did you ever tell any of your wives that they shouldn't smoke?

A. No.

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Q. Tell us, please sir, about your formal education since high school?
A. I went to college, got a college degree in chemistry.
Q. Where was that?
A. Columbia University in New York.
Q. And when was that?
A. 1957 to 1961.
Q. And that's a Bachelors degree in Chemistry?
A. Yes.
Q. Do you have formal education since then?
A. Yes.
Q. Describe it, please?
A. I attended graduate school at the University of Michigan.
Q. Did you take a degree there?
A. Yes.
Q. What degree was that?
A. A Ph.D. in Chemistry.
Q. What year was that, sir?
A. 1966.
Q. Do you have formal education since then?

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A. No.

Q. Did you write a dissertation for your Ph.D.?

A. Yes.

Q. What was the topic?

A. The topic dealt with the physical chemistry of the decomposition of certain types of proestrus.

Q. In your training in chemistry did you specialize in any area?

A. The area's called physical organic chemistry.

Q. Describe for the record, please, what that is?

A. That is essentially the study of organic chemicals, looking at either their properties or the kinetics of reaction, so applying the techniques of physics to organic chemistry.

Q. And just describe for the record, please, what kinetics are?

A. Kinetics are the rate of reaction.

Q. At any time have you taken courses in toxicology?

A. No.

Q. Describe for us, please, your

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employment history. What I'm interested in is jobs that you held since college. I would like to know the title of the job, the location of the job and the years that you were employed there as well as your title?

A. My first position after I got my degree was--

Q. By degree are we referring to your BA?

A. No, I'm referring to the my Ph.D.

Q. Could we start with the BA, please?

A. I had no employment history because I went directly to graduate school and had no employment history until I received my Ph.D.

Q. Thank you?

A. So my first job after I got my Ph.D. was what is called a post-doctoral position at the University of Louisiana in New Orleans and spent about a year and a half there.

Q. What year did you commence that employment?

A. 1966.

Q. Did you have a title?

A. Post-doctoral fellow.

Q. What did you do in that position?

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A. I carried out the synthesis of small ring compounds, particularly a compound called trimethylene cyclopropane.

MR NUNLEY: Counsel let me ask you. There clearly will be some technical terms. Would you like the witness to spell technical terms or have the court reporter indicate if he could use some help?

MISS BRACHTL: Thank you. Here's how I would like to proceed and let us leave it up to the court reporter. I am concerned about the amount of time we have today. I would like not to take up deposition time to spell things and I wonder if we might better do that at a break or during lunch unless that would prejudice the court reporter.

MR NUNLEY: That's fine with us. Okay.

BY MISS BRACHTL:

Q. And your job after that was?

A. I took another post-doctoral appointment at the University of Texas.

Q. What year did you commence that?

A. It would have been, if I remember correctly, 1968.

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Q. How long were you employed there?
A. Only about 6 months.
Q. And you did what?
A. I was working on looking, developing model chemical reactions based on the chemistry of vitamin B12.
Q. Did you complete that work?
A. No, I did not.
Q. You quit before you were completed with it?
A. Well I quit. If I may, to clarify that; the work has never been completed to this day. No one has ever solved that problem.
Q. Thank you. Where did you work after that?
A. I left chemistry for about a year and a half for personal reasons, went to New York and worked for a little over a year at a brokerage firm.
Q. What did you do at the brokerage firm.
A. I worked in what is called the back office and eventually, before I finished, I was doing all of the balancing for the trades for the firm for each day.

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Q. How long were you there?
A. A little over a year.
Q. So you left there in what year?
A. 69.
Q. And your next employment was?
A. Was at the University of Pittsburg where I started out as a research fellow then after 2 years became an Assistant Research Professor at the Graduate School of Public Health at the University of Pittsburg.
Q. What year did you begin your position as a research fellow?
A. 1969.
Q. And you continued that until about 71?
A. 71 I became Assistant Research Professor.
Q. When you were a research fellow did you do research?
A. Yes.
Q. Was there any specific type of research that you did?
A. I was doing research involving the radiation chemistry of sugars.
Q. And in 71 you became an assistant in the Graduate Public Health Department is that

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right?
A. Yes.
Q. Thank you. How long did you maintain that position?
A. Two years.
Q. What did you do while you held that position?
A. I did some teaching but I continued to do my research.
Q. And the research was in the same subject we have been taking about?
A. Yes, in the same subject.
Q. What was it that you taught?
A. Biochemistry.
Q. Any particular type?
A. No.
Q. When you let there where did you go?
A. Philip Morris.
Q. What year was that?
A. 1973.
Q. You began at Philip Morris in what position?
A. I was a research scientist in what we called the Organic Chemistry Group.

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Q. Have you worked at Philip Morris continuously since 1973?
A. Yes, I have.
Q. When you worked for Philip Morris in 73 where did you work geographically?
A. In Richmond, Virginia.
Q. How long did you remain a research scientist in the Organic Chemical Group?
A. I was promoted to Senior Scientist and I don't remember the exact year.
Q. Can you give me an approximation?
A. It would have been about 76 or 77.
Q. And were you still, as a Senior Scientist, located in Richmond, Virginia?
A. Yes.
Q. How long did you maintain the position of Senior Scientist?
A. Until 1979 or 80.
Q. What happened then?
A. I became manager of the Chemical Research Division.
Q. Were you still operating out of Richmond, Virginia?
A. Yes, I was.
Q. How long did you act as manager of

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the Chemical Research Division?
A. Approximately 3 years.
Q. So that lasted until about 1983, approximately, is that right?
A. Approximately.
Q. What happened then?
A. I became manager of the Biochemical Research Division.
Q. Were you still operating out of Richmond, Virginia?
A. Yes, I was.
Q. How long were you manager of the Biochemical Research Division?
A. Again about three years.
Q. So that lasted until about 86, right?
A. 86 or early 87.
Q. And what happened in 86 or early 87?
A. I became them Principal Scientist.
Q. That was your title, Principal Scientist?
A. That was my title.
Q. Did you still operate out of Richmond, Virginia?

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A. Excuse me. I became Associate Principal Scientist.

Q. Thank you. As Associate Principal Scientist did you still operate out of Richmond, Virginia?

A. Yes, I did.

Q. And as Associate Principal Scientist were you still affiliated with the Biochemical Research Division?

A. No, I was not.

Q. How long did you maintain the position of Associate Principal Scientist?

A. Approximately two years after I was promoted to Principal Scientist.

Q. Am I correct in thinking you became promoted to Principal Scientist in about 89?

A. As far as I remember.

Q. When you were Principal Scientist did you continue to operate out of Richmond, Virginia?

A. Yes, I did.

Q. And in all the questions when I've asked where you operated out of and your answer was Richmond, Virginia, did you live at or around Richmond, Virginia?

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A. Yes, I did.

Q. How long did you maintain the position as Principal Scientist?

A. Until 1992.

Q. What happened then?

A. I became Vice Director of research at FTR in Neuchatel.

Q. Did that occasion a move?

A. Yes.

Q. When did you move?

A. 1992.

Q. Until you moved were you located in Richmond, Virginia?

A. Yes.

Q. There are different Philip Morris entities. Up until 1992 when you became Vice Director of Research at FTR, who exactly was your employer?

A. Philip Morris, USA.

Q. And after you moved to FTR, did your employer continue to be Philip Morris, USA?

A. Yes.

Q. How long were you Vice Director of Research at FTR?

A. Three years.

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Q. In about 1995 you assumed a different position, correct?
A. That's correct.
Q. What was that position?
A. Principal Scientist.
Q. At FTR?
A. No, in Richmond.
Q. Oh, I see. Did you live in Switzerland from 92 to 95?
A. Yes.
Q. When you became Principal Scientist in Richmond, did you move back to the United States?
A. Yes, I did.
Q. When was that?
A. It would have been 1995.
Q. Do you have any idea what month that would be?
A. March, end of March.
Q. How long did you remain Principal Scientist in Richmond?
A. One year.
Q. Until 96, right?
A. Until 96.
Q. And then you moved back to

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Switzerland?
A. That's correct.
Q. And your position became what?
A. Principal Scientist.
Q. Is that your position today?
A. Six months later they added the phrase "Assistant to the Director".
Q. Can you tell me what month that was?
A. No.
Q. Okay. It was in 1996 though, right?
A. Yes.
Q. Is your current title Principal Scientist, Assistant to Director?
A. Yes.
Q. You told me that prior to the time you became Vice Director of Research at FTR your employer was Philip Morris, USA, and while you were Vice Director of Research at FTR your employer was Philip Morris USA. After you were Vice Director of Research at FTR was your employer still Philip Morris, USA?
A. Yes.
Q. So all the time that you've worked

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at Philip Morris your employer's been Philip Morris USA, right?

A. That is correct.

Q. I would like you to do the following, if you would. You've detailed for us your employment history at Philip Morris, telling us your titles and the years. Could you go back and just generally tell us how your responsibilities changed in each position?

Strike that. I better do it by question and answer.

MR NUNLEY: I was just going to ask you, just to help him if you could kind of walk back through the chronology you've established and ask him, "What did you do in this position?" I think that would produce a better record.

BY MISS BRACHTL:

Q. That's what I'm going to do right now. I'm going to ask you about each of those positions and what I'd like you to tell me is what your primary responsibility was, who you reported to and basically what you did. Let's start with that line of questioning.

When you began in 1973 as a research scientist in the Organic Chemical Group

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in Richmond, Virginia, what did you understand your job to be?

A. At that time my job was to carry out research in the area of organic chemistry.

Q. Well did it have anything to do with tobacco?

A. (Pause) If I may ask you a question. You asked a question about responsibilities.

Q. Right?

A. And I'm not trying to be difficult here, I'm trying to understand exactly what you want to know.

Q. Okay?

A. Are you talking about responsibilities or what actually the work that I did?

Q. Okay. Thank you for asking that. I'll try and clarify it. Tell me about what work you did, please?

A. Okay.

Q. Thank you?

A. Most of the work during that time was involved in two different projects, one which was the synthesis of compounds, the synthesis and study of compounds, which were similar to nicotine; and the other was the synthesis of

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compounds that we called flavor release molecules.

Q. And the compounds that are similar to nicotine were they sometimes referred to as nicotine analogues?

A. Yes, they were.

Q. Tell me please to whom did you report?

A. I reported to Walter Gannon.

Q. Did anyone report to you?

A. I had, when I started, six people reporting to me.

Q. What was Mr Gannon's title at that time?

A. Manager of -- I'm not sure, because they split the Division later. It may have just been Manager of Research. I'm really not sure.

Q. The work that you did on synthetic compounds that were similar to nicotine, was there a name of a program that involved that work, like the Nicotine Analogue Program or something else?

A. It was generally called the Nicotine Analogue Program.

Q. Can you tell me, to the best of your knowledge, when the Nicotine Analogue Program began.

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MR NUNLEY: Objection, foundation.

MISS BRACHTL: Well I asked him to the best of his knowledge. I think that corrects the objection.

BY MISS BRACHTL:

Q. Sorry. Let me ask that question again. Did you ever hear when the Nicotine Analogue Program began?

A. Not exactly.

Q. Did you ever hear anyone say when the Nicotine Analogue Program began?

A. Not exactly.

Q. Okay, not exactly, but generally?

A. I would assume, and I don't really know for sure, that it began about three or four years before I came. So it would have been about 1969 or 1970.

Q. Thank you?

A. And I do not know exactly.

Q. Thank you. Was there someone who, when you came to Philip Morris, was in charge of the Nicotine Analogue Program?

A. I was brought in to be in charge of that program.

Q. Okay. You also worked on organic

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chemistry dealing with flavor release molecules. Was that work part of a program that had a name?

A. We just called it simply synthesis of flavor release compounds.

Q. Do you know when that program began?

A. Not exactly.

Q. Were you also head of the synthesis of flavor release compounds program?

A. Yes, I was.

Q. In 1976 you became Senior Scientist. Did the work that you did change?

A. No, it did not.

Q. So am I correct in thinking that from 76 till 79 you continued your research in the Nicotine Analogue Program?

A. That is correct.

Q. And did you also during that period continue your research into the synthesis of flavor release compounds?

A. Yes, I did.

Q. When you became Senior Scientist did you continue to report to Mr Gannon?

A. Mr Gannon took another position, I think, in 1975 as Director of Development and he was

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succeeded by Mr William Johnson.

Q. So when Mr Gannon ceased to hold the position he had formerly held, did you report instead to Mr Johnson?

A. Yes, I did.

Q. Do you recall Mr Johnson's title at that time?

A. Manager of Chemical Research.

Q. In 1979 you became Manager of the Chemical Research Division, you have testified?

A. Yes.

Q. Did the nature of the work that you did change when you became Manager of the Chemical Research Division?

A. Yes.

Q. How did that manifest?

A. I ceased doing any laboratory work myself.

Q. Did you continue to be -- well what did you do?

A. I continued, but at a more administrative level, to continue to supervise the group that was doing the work I have already described.

Q. So am I correct in thinking that when you became senior scientist you assumed more of a supervisory role in the program dealing with

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nicotine analogues as well as the program dealing with synthesis of flavorings?

MR NUNLEY: Objection.

BY MISS BRACHTL: Strike that.

Q. Am I correct in understanding that when you became Manager of the Chemical Research Division you assumed more of a supervisory role over the Nicotine Analogue Program?

A. That is correct.

Q. And did you also at that time assume more of a supervisory role over the flavor and compounds program?

A. That is correct.

MR NUNLEY: I think, just for the record, it's the flavor release program.

BY MISS BRACHTL: Thank you.

Q. To whom, if anyone, did you report during the time that you acted as Manager of the Chemical Research Division?

A. Dr Thomas Osdene.

Q. What was Dr Osdene's position then?

A. Director of Research.

Q. You then became Manager of the Biochemical Research Division. When that happened did you continue to be involved with the Nicotine

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Analogue Program?
A. No.
Q. Did you cease your involvement with the Nicotine Analogue Program?
A. Yes, I did.
Q. Did the Nicotine Analogue Program continue?
A. Yes, it did.
Q. When did you cease your involvement with the Nicotine Analogue Program?
A. When I became Manager of Biochemical Research, which would have been 1980 to 1983. I don't remember the exact date.
Q. How long did the Nicotine Analogue Research Program continue?
A. I don't remember exactly. I would think another year or two.
Q. So approximately the Nicotine Analogue Program continued to 84 or so, is that right?
A. I think so.
Q. And after you ceased to supervise that program who took over supervision?
A. Most of the supervisory responsibility was with a Dr Jeff Seeman.

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Q. When you became Manager of the Biochemical Research Division did you continue to have any involvement with the synthesis of flavor release compounds?

A. No.

Q. Did someone else assume supervision of that program?

A. Also Dr Seeman.

Q. How long did that program continue, as far as you know?

A. I would say at least another 7 or 8 years.

Q. After you ceased to supervise the Nicotine Analogue Program, did you none the less keep apprised of what was going on with that program?

A. Informally.

Q. How would that happen?

A. Conversations with scientists who were working in the area; also, of course, attendance at seminars or presentations.

Q. When you say attendance at seminars are you referring to seminars within Philip Morris?

A. Yes.

Q. And presentations within Philip

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Morris?

A. Yes.

Q. When you became the Manager of the Biochemical Research Division your duties became what? Strike that.

What work did you do a Manager of the Biochemical Research Division?

A. I supervised five different groups, one group which was studying smoke chemistry, a group doing entomological research.

Q. For the record, what does that mean?

A. Research on insects.

Q. Thank you. What else?

A. Two groups that were dealing with development and use of biological assays.

Q. In what field?

A. Bacterial assays, the famous Ames test.

Q. And?

A. And one group that we called the electro physiology group.

Q. What did that group do?

A. That group, at the time, was interested in looking at using electro physiological techniques to learn more about how people process information

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about flavors, how they perceive flavors.

Q. Electro physiological techniques, can you tell us the physiological techniques you're talking about?

A. We're talking about generally EEG's and looking at brain response to flavor stimuli.

Q. The entomological research, which is research, as I understand, that was being done on bugs, what was the subject matter of that research?

A. It was an insect called the cigarette beetle which is a -- was, much less, now -- a major pest for tobacco and consumes large amounts of raw tobacco.

Q. So that the entomological research division didn't do research relating to how tobacco or nicotine affects humans, right?

A. No.

Q. Thank you. I'm sorry, did you say that Dr Osdene was the person to whom you reported when you were Manager of Biochemical Research?

A. I didn't say. The person I reported to as Manager of Biochemical Research was Dr Jim Charles.

Q. Thank you. When you became an

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Associate Principal Scientist did your day to day work change?

A. Yes, it did.

Q. What did it become?

A. I was coordinator of a project whose objective was to develop a smoking article that was at least as good if not better than Reynolds Premier.

Q. What was Reynolds Premier?

A. It was a cigarette or device or smoking article, depending on how you want to call it, that heated tobacco instead of burning it, that was released for a test market in 1986 or 87. I don't remember the exact date.

Q. And was it a goal of Philip Morris to develop a smoking article that was as good as Premium?

MR NUNLEY: Objection as to what Philip Morris's goal was.

BY MISS BRACHTL:

Q. Did you understand it to be a goal of Philip Morris to develop a cigarette or smoking device that was at least as good as Premium?

A. That was my understanding.

Q. What did you understand the reason

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to be for that?

MR NUNLEY: Objection, foundation.

BY MISS BRACHTL:

Q. Strike that. Did you have an understanding of why Philip Morris would want to develop a smoking material that was at least as good as Premium?

MR NUNLEY: Excuse me, the same objection.

BY MISS BRACHTL:

Q. You can answer it. Unless he tells you not to answer you can answer. If he doesn't want you to answer he'll certainly tell you?

A. To someone in my position the answer is obvious. Philip Morris has always, you know, monitored what its competitors are doing and any new product that would be introduced by a competitor, Philip Morris would immediately look at a project to at least be able to be sure that they could do something at least as well.

Q. Was there something unique about Premium?

A. Premier.

Q. Thank you.

MR NUNLEY: Objection as to form.

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I don't know what you mean by unique.
BY MISS BRACHTL:
Q. You can answer.
A. I think, yes, there was something unique about Premier. It was not a conventional cigarette.
Q. In what way?
A. It was not simply tobacco wrapped in paper but rather used an external heat source to heat the tobacco flavor and provide simply the flavor to the smoker.
Q. Did you do anything as Principal Scientist other than work on that project?
A. After two years, yes.
Q. What was that?
A. I then became, was put in charge of all projects dealing with cigarette paper.
Q. To whom did you report when you did that?
A. Cliff Lilly.
Q. What was Mr Lilly's title?
A. Research fellow.
Q. Was one of the things that you worked on during that period of time coming up with a paper that would act as a masking agent for

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nitrosamines in sidestream smoke.

MR NUNLEY: Objection as to form.

THE WITNESS: I'm afraid I couldn't possibly answer that question. I don't know at all what you mean by "a masking agent" for nitrosamines in sidestream smoke. I'm not aware of any such thing.

BY MISS BRACHTL:

Q. Okay. When you worked on cigarette papers, was one of the things that you worked on finding a paper that would effect nitrosamines in sidestream smoke?

A. No.

Q. Are you aware of any research that was done on that subject?

A. No.

Q. In 1989 when you became Principal Scientist, what did you work on?

A. I was, at that time, and I don't remember the exact chronology, I don't remember whether I became Principal Scientist when I was still working on the Premier project or when I had already started the paper project, but the one had nothing necessarily to do with the other. The promotion did not indicate a shift in

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responsibility, it was simply a promotion.

Q. While you were Principal Scientist you continued to report to Mr Lilly?

A. Yes.

Q. Then in 1992 you became Vice Director of Research at FTR?

A. Yes.

Q. Did your work change when that happened?

A. Yes.

Q. How?

A. I had four small divisions reporting to me, one dealing with biotechnology, two with analytical chemistry and one dealing with measurements of sidestream smoke.

Q. The one that dealt with biotechnology, specifically what work was that division doing from 92 to 95?

A. There were a number of projects that they did. First of all, they also dealt with microbiology. There was work going on in order to develop assays to be able to identify tobacco that may have been genetically engineered tobacco. There was some work that went on looking into the feasibility of using biotechnology to synthesize

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very complex tobacco flavor molecules.

Q. Is that it?

A. That's all I can remember right now.

Q. So a biotechnology division reported to you. How many people were working in that division?

A. Four.

Q. What were their names?

A. Rotio Godani, Vincent Wagner and Pascal Kaylin; and there was a technician who's name I have forgotten.

Q. When you said that the biotechnology group was trying to develop technology to identify genetically engineered tobacco, were you talking about genetically engineered tobacco that might be contained in competitors' cigarettes?

A. No. Philip Morris currently has a policy against using genetically engineered tobacco because it is not legal in certain countries, and yet we buy tobacco worldwide, particularly in a country like China which we had heard was producing increasing amounts of genetically engineered tobacco. We wanted to see if we could be sure we didn't inadvertently buy some and use

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some.

Q. Thank you. The analytical chemistry groups that reported to you, what work were they doing during the time they reported to you?

A. There was one project was twice a year, which was a very large project twice a year, to ensure that the flavors we were importing into the United States were within specifications. There was also a major continuing project measuring pesticide levels on tobacco. They were also doing work in the nitrosamine area. They also did a lot of just general fulfilling of requests.

Q. When you say fulfilling of requests, you mean requests submitted to them for research to be done?

A. Not research, simply troubleshooting, problem solving, ranging from anything from something found in tobacco that they wanted identified or perhaps an off odor.

Q. What research was being done in the nitrosamine area?

A. Research which had been continuing research to try to find technologies that would reduce nitrosamines in mainstream smoke.

Q. Do you know when that research

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began at FTR?

A. No.

Q. Was the research on the nitrosamines being done at FTR when you got there?

A. Yes.

Q. It was already on going. Who was in charge of it when you got there?

A. At that time Dr Jean Jaque Pierde.

Q. Before you became involved in the nitrosamine research in 1992 did you have any involvement with nitrosamine research?

A. Yes.

Q. When did that begin?

A. When I became Manager of Biochemical Research in 1982/83.

Q. What research was being done in 82 and 83 on nitrosamines at Philip Morris?

A. Again the objective was to develop technologies, to attempt to develop technologies to reduce nitrosamines in mainstream smoke.

Q. Do you have any understanding of when Philip Morris began the research directed to trying to reduce nitrosamines in mainstream smoke.

MR NUNLEY: Objection as to form and foundation.

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THE WITNESS: Not exactly. It was probably around 78 or 79, but I don't really know exactly.

BY MISS BRACHTL:

Q. Was that research ever concluded?

A. It is still on going.

Q. Thank you. You have talked about research into nitrosamine in mainstream smoke. Would your answers that you've given so far be different if I asked you about reduction of nitrosamines in sidestream smoke?

MR NUNLEY: Objection as to form.

BY MISS BRACHTL:

Q. Let me withdraw that question. Has Philip Morris done research into reduction of nitrosamines in sidestream smoke?

A. Any method that we would use to reduce them in mainstream smoke would also forcibly reduce them in sidestream smoke, so there was no need to focus on sidestream smoke.

Q. Did there come a time when there was a goal that you were aware of to try and reduce nitrosamines in sidestream smoke?

MR NUNLEY: Excuse me, goal of whom.

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MISS BRACHTL: Philip Morris.

THE WITNESS: Not that I am aware -- well, if you'll forgive me, I'm afraid that's almost an unanswerable question. Philip Morris has always been concerned about nitrosamines in sidestream smoke, so if I said there wasn't a goal it sounds like we weren't concerned. But, as I say, there wasn't a goal because anything we would have done to mainstream would have also done something to sidestream.

BY MISS BRACHTL:

Q. Thank you. If you reduce sidestream would that also cause mainstream nitrosamines to be reduced?

A. Yes.

MR NUNLEY: Martis, whenever it's convenient I'd like to take a short break.

MISS BRACHTL: Okay, can I finish this line of questions? I have about eight minutes.

MR NUNLEY: Yes, absolutely.

BY MISS BRACHTL:

Q. I just want to finish understanding what different work you have done at Philip Morris. Let's stay in 92 to 95 when you were Vice

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Director of Research at FTR. Did you report to someone?

A. Yes.

Q. To whom?

A. Dr Alan Kassman.

Q. Was he in Switzerland?

A. Yes.

Q. The research that was on going at FTR, were the results of that research communicated somehow to Philip Morris in the United States?

A. There were quarterly reports written that covered all of that research which were routinely sent to the United States. In addition, there were informal contacts as well.

Q. And where to in the United States were the quarterly reports sent?

A. At least Richmond. I'm not sure about whether they might be sent elsewhere.

Q. Then in 95 you came back to the United States?

A. Yes.

Q. And your work from roughly I think you said March 95 until 96, when you went back to Switzerland, was what?

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A. I was working in the Scientific Affairs Group and my responsibilities dealt with environmental tobacco smoke.

Q. Could you be a little more specific?

MR NUNLEY: As to What portion of the answer?

BY MISS BRACHTL:

Q. Well about the work that you were doing on environmental tobacco smoke?

A. It's difficult to be specific. Any scientific matter that involved environmental tobacco smoke.

Q. Did you continue your work on nitrosamines during that time?

A. No.

Q. To whom did you report when you were involved in scientific affairs?

A. Dr Richard Cauchman.

Q. And then you came back to Switzerland in 96?

A. Yes.

Q. And your work was what?

A. The work remained the same.

Q. Has it changed since then?

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A. No.

Q. So am I correct in thinking that what you do now is principally involved with environmental smoke?

A. Environmental tobacco smoke, yes.

MISS BRACHTL: Thank you. We can break?.

MR NUNLEY: Yes. I realize you're concerned with time. We'll keep it short. I guess I'm also playing host and if there's anything I can do at the break let me know.

MISS BRACHTL: Thank you so much. It's appreciated.

Off the record at 1125 a.m.

On the record at 1145 a.m.

MR NUNLEY: We have had a couple of slight miscommunications. It may be cultural difference. I failed to say as we broke we were going to take a break. So for the record if there appears to have been an interruption it is because counsel for the plaintiffs and the defendants agreed to take a break. I think we've been out for approximately ten minutes.

EXAMINATION:

BY MISS BRACHTL: (Continued)

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Q. Dr Sanders have you done anything to prepare for this deposition?

A. Yes.

Q. Tell me please what you've done, but don't reveal to me any communications that you might have had with your counsel.

MR NUNLEY: You're asking have we met, wben we met?

MISS BRACHTL: I'm just generally, right now, asking what he's done.

THE WITNESS: I met for two days, yesterday and the day before yesterday, to discuss my deposition.

BY MISS BRACHTL:

Q. You met with whom?

A. I met where Mr Nunley and with Mr Gene Peck.

Q. Who is Mr Gene Peck?

A. Mr Gene Beck is attorney for Shook Hardy and Bacon in London.

Q. Who is Mr Peck? Is Mr peck your attorney?

A. No.

Q. Does Mr peck represent Philip Morris?

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A. Yes, at times.

Q. Was it your understanding, when you were meeting with Mr Peck, that he was meeting with you as the representative of Philip Morris?

A. I don't know the answer to that.

Q. Other than meet with the attorneys whom you have identified for two days to prepare for deposition did you do anything else?

A. No.

Q. Did you have any telephone conversations with your attorneys other than any you might have had in the last two days to prepare for your deposition?

MR NUNLEY: Not to reveal the contents. She's just asking whether conversations took place.

THE WITNESS: No.

BY MISS BRACHTL:

Q. Did you have any meetings with your counsel before the meetings you had in the last two days to prepare for your deposition?

A. No.

Q. Other than anything you may have done with your counsel, did you review any documents to prepare for your deposition?

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A. No.

Q. You've had meetings with your counsel for two days you have said. The first date where did you meet?

A. In the law offices of Shook Hardy and Bacon here in London.

Q. How long did that meeting last?

A. It started at approximately noon and went to about 6.30.

Q. And you also met with counsel yesterday. Correct?

A. That's correct.

Q. Was that meeting also at the Shook Hardy offices?

A. Yes, it was.

Q. How long did that meeting last?

A. It started at approximately 9.30 and finished at about six.

Q. Did you have any conversations with your counsel other than any you might have had today, other than the ones you have told me about, to prepare for your deposition?

A. No, I have not.

MISS BRACHTL: Counsel, can you tell me who Mr Peck represented during those, that

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meeting?

MR NUNLEY: He was there both for Philip Morris and for the witness for the purposes of his time at Philip Morris.

MISS BRACHTL: So you're telling me that Shook Hardy represented Philip Morris in working with Dr Sanders?

MR NUNLEY: Yes.

MISS BRACHTL: Thank you.

BY MISS BRACHTL:

Q. During your meetings with counsel to prepare for your deposition did anyone come into the room other than the three of you?

A. Sorry. I was going to finish. There was a third attorney present. Mrs, or Miss, I don't know, Gillian Turner.

Q. Do you know the name of the law firm that she is with?

A. No, I don't.

Q. Do you know who she represented?

A. No, I really don't.

MISS BRACHTL: Counsel, can you tell me that?

MR NUNLEY: She's counsel for Philip Morris.

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MISS BRACHTL: And what firm is she?

MR NUNLEY: Davis Poke.

MISS BRACHTL: Here in London?

MR NUNLEY: No, in New York. Well, actually she is in London.

MISS BRACHTL: She is in London, and Mr Peck was from London Shook Hardy, thank you.

BY MISS BRACHTL:

Q. You are aware, are you not, that other tobacco company employee's have had their depositions taken in the tobacco litigation or hearing?

A. Yes.

MR NUNLEY: When you say "tobacco litigation", you mean these two cases or--

MISS BRACHTL: That was unclear.

BY MISS BRACHTL:

Q. In preparing for your deposition, other than anything your lawyer may have talked to you about -- strike that. Don't ever tell me anything that your lawyer may have told you, okay. All right.

Have you read any deposition transcripts to prepare for your deposition?

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A. No.

Q. Have you read any deposition transcripts period?

A. No.

Q. Have you discussed with anyone who has given a deposition in these proceedings, their deposition?

A. No.

Q. You know Mr Seeman, right?

A. Yes.

Q. When was the last time you talked to him.

MR NUNLEY: It's Dr Seeman.

MISS BRACHTL: Thank you. Sorry.

BY MISS BRACHTL:

Q. When was the last time you talked to Dr Seeman?

A. I think about three weeks ago.

Q. Did you talk to him ever about his deposition?

A. Only that he had given a deposition.

Q. Did he tell you anything about it?

A. No.

Q. And you know Dr Osdene?

A. Yes.

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Q. Did you talk to him about his deposition?

A. No.

Q. Did you hear anything about his deposition?

A. No

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Q. Did you ever here that he took the Fifth in his deposition?

A. I think I read something to that effect in the newspaper. But I'm not sure which deposition it was.

MR NUNLEY: We may have a problem with that that we need to take up at the break. I think Dr Osdene's deposition is sealed under Texas and Minnesota, so I don't know where you got the information or the allegation that he took the Fifth, but I think that's subject to a sealing order in the Minnesota case and the Texas case.

MISS BRACHTL: Let's make a mark on the videotape and the transcript. Actually, let's go off the record a minute.

Off the record at 1142 a.m.

Back on the record at 1146 a.m.

MISS BRACHTL: Counsel, it is my

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understanding that reports of Dr Osdene's deposition have appeared on the Internet and in the press.

BY MISS BRACHTL:

Q. Dr Sanders, you have not given your deposition before but have you ever given sworn testimony before?

A. May I ask you whether you are referring specifically to matters dealing with my employment or matters outside my employment.

Q. I'm asking whether at any time in your life you're given sworn testimony--

A. Yes, I have.

Q. -- about anything. Just tell me, please, the occasion on which you have given sworn testimony? What I mean is if it's been in a case tell me the name of the case, what the case was about and when, just very generally?

A. I don't know remember the name of the case. It was many years ago. I was an involved in an automobile accident. We sued the other driver and I gave testimony describing my conduct and driving.

Q. Thank you. Other than on that occasion have you given sworn testimony before any

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sort of a body?
A. No.
Q. Have you ever given sworn written testimony, by that I mean an affidavit or a statement that someone notarized.
MR NUNLEY: Objection as to the characterization. You may answer the question.
THE WITNESS: I'm sure I've given sworn testimony that someone has notarized dealing with at least one, if not two, divorce actions
BY MISS BRACHTL:
Q. Thank you. Other than that?
A. Not that I can think of.
Q. Have you ever written any articles that were published?
A. In scientific journals, yes.
Q. How many?
A. Twenty-five or thirty.
Q. That's a lot. Can you tell me, please, generally, the subject areas on which you've written?
A. They all deal with various aspects of organic chemistry.
Q. Did any of the articles you've written address tobacco.

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MR NUNLEY: Objection as to form.

THE WITNESS: Not as such. They may be involved in areas of interest to the tobacco business, but not addressing tobacco as such, that I can think of.

BY MISS BRACHTL:

Q. What articles have you written that might deal with areas of interest to the tobacco industry.

MR NUNLEY: If you'd like, Dr Sanders, just to the extent you can recall, you can tell counsel what articles you have written and what they dealt with.

THE WITNESS: I wrote a number of articles dealing with synthesis of what we have called nicotine analogues.

Off the record at 1149 a.m. to change tape.

Back on the record at 1150 a.m.

THE WITNESS: I published one article dealing with the kinetics of nicotine absorption and desorption. And right now I don't remember other topics that would be relevant to the tobacco business,

BY MISS BRACHTL:

Q. Thank you. How many articles have

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you written on the kinetics of nicotine absorption and desorption?

A. Just one.

Q. When did you write that and where did it appear?

A. It was written approximately a year and a half ago and to my knowledge has still not appeared yet. It's been submitted to the journal and accepted for publication but has not yet appeared.

Q. Which journal?

A. I don't remember.

Q. An American journal?

A. I think so.

Q. How many articles have you written on synthesis of nicotine analogues?

A. Probably about ten.

Q. Where have they appeared?

A. Various journals, primarily Journal of Organic Chemistry would be the largest number.

MISS BRACHTL: Counsel, I'm going to ask you to produce those articles.

BY MISS BRACHTL:

Q. While you worked at Philip Morris did you maintain a research notebook?

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A. For my own laboratory work, yes, I did.

Q. Did you always maintain such a thing?

A. As long as I was working in the laboratory, yes.

Q. So what years would that be that you maintained research notebooks?

A. 1973 to 1979, 1980.

Q. Describe them for me physically. Were they were bound, did they have a ring, did they have, you know, holes?

A. Bound notebooks, when I started consisting of 100 pages. Later we went to 200 pages and it was necessary to date each entry. At the bottom of the page there was a place asking that you sign after the page was complete and then a supervisor signed, or someone else not necessarily a supervisor, but another scientist have signed to indicate that it had been read and understood.

Q. So am I correct in thinking that the maintaining of research notebooks was part of a Philip Morris procedure?

A. Absolutely.

Q. Did they give you the notebooks? Did they supply the notebooks to you?

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A. Yes, they did.

Q. When you finished with the notebook, when you completed a notebook did you keep it or give it to Philip Morris or did something else happen to it?

A. When a notebook was completed it was first of all looked through by one supervisor to be sure that everything had been done properly. It was then sent to what we call central files where either it was kept in central files or it was micro filmed and if you requested it then they would give you the notebook back.

Q. I see. Did you ask for copies of your notebooks back?

A. Yes, always.

Q. Did you keep them?

A. Yes.

Q. Where are they?

A. They are now back down in central files because I turned them over when I stopped doing laboratory work.

Q. And so far as you know they are still there, right?

A. So far as I know they are still there.

Q. Have you maintained any copies of

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the notebooks you kept from 77 to 79?
A. No.
MR NUNLEY: Excuse me, you mean separate and apart from the copies that are in central files? You mean copies he's kept himself?
MISS BRACHTL: Yes, personally.
THE WITNESS: No.
BY MISS BRACHTL:
Q. Thank you. Any time after 79 did you keep a research notebook?
A. I kept the current research notebook that I had been using in 79 for probably another year or so, thinking I might have some time to do some laboratory work and finally decided I was not going to have any time to do laboratory work.
Q. So you gave them to central files?
A. I gave them back to central files.
Q. Any time after that did you maintain a research notebook?
A. No.
Q. After 79 when you ceased doing hands on research, did you ever supervise or initial the research notebooks of people whom you supervised?

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MR NUNLEY: Objection compound.

THE WITNESS: Yes, I did.

BY MISS BRACHTL:

Q. Okay, and for how long a period did you do that?

A. Well, as long as I was Manager which would have been up through about 1986/87.

Q. Did you ever make copies of those notebooks?

A. Never.

Q. So far as you know were those notebooks sent to central files?

A. So far as I know, yes.

Q. We've been talking about research notebooks. Have you ever heard of a laboratory notebook?

A. That is sometimes what people call research notebooks, laboratory notebooks; they are one and the same thing.

Q. Other than as you've testified did you keep any personal notes of the work that you did while at Philip Morris?

A. No.

Q. Did you ever work at home?

A. In what way?

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Q. Writing about what you had done?
A. No. Reading, yes.
Q. Okay. All right. Do you have at your home any documents relating to work that you did while at Philip Morris?
A. No.
Q. From time to time while you at Philip Morris did you write memoranda describing the research that you were doing or that you supervised.
MR NUNLEY: Objection to form.
MISS BRACHTL: Strike that. Thank you.
BY MISS BRACHTL:
Q. From time to time at Philip Morris did you prepare memoranda or reports describing research that you were doing?
A. Yes.
Q. Okay. And from time to time while you were at Philip Morris did you prepare memoranda or reports describing research that you supervised?
A. Yes.
Q. Was it your practice to keep copies of such memoranda or reports.

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MR NUNLEY: Clarification? In addition to the copies for his -- I object to the question. It's vague. I don't understand if you're saying within the Philip Morris entity did he keep a copy or were there two copies, one in essence for Philip Morris and one his.

MISS BRACHTL: Let me rephrase that question then.

BY MISS BRACHTL:

Q. When I write a letter I send it to somebody and my secretary keeps a copy for me?

A. I think I can answer your question.

Q. Thank you.

A. Any report that I've written there was certainly a copy that was sent to the individual it was addressed to. Frequently there were other people who were copied, cc'd; there were copies sent to them. I would almost invariably keep a copy in my files at work and a copy was sent to central files.

Q. Thank you. The copies that you kept at work, who maintained them, meaning your secretary, yourself, someone else?

A. During the period of time when I had secretaries my secretary maintained them. When

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I was Principal Scientist I really did not have a secretary. I maintained them.

Q. So where are those copies now?

A. With the exception of reports that I have written in the last two years, all those copies have been turned over to central files or, in certain cases, given to my successors if they were important to them.

Q. Have you maintained your own personal copies of any memos that you have written other than memos you may have written in the last two years?

A. No.

MR NUNLEY: In addition to what he has just testified to?

MISS BRACHTL: Yes.

BY MISS BRACHTL:

Q. And from time to time during your employment at Philip Morris you have received copies of memoranda -- correct?

A. Yes.

Q. Did you have a system for maintaining those?

A. Yes.

Q. What was that?

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A. They would be filed under some sort of logical system.

Q. Do you have copies of those documents now?

A. I have no copies of any memoranda that have been received before the last two, two and a half years since I became involved in my current responsibilities.

Q. Were those memoranda sent some place or destroyed before the last two years?

MR NUNLEY: Objection. Compound.

BY MISS BRACHTL:

Q. You can answer it.

A. The memoranda would either again have been sent to central files or given to my successors if they felt such memoranda were useful to them.

Q. And if a memorandum was sent to central files was that because you directed it to be so?

A. Yes.

Q. And was there a time when you directed that all your memoranda, other than those that went to your successors, be sent to central files?

A. Yes.

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Q. When was that?
A. Oh, I don't remember.
Q. Did you do it in one fell swoop?
A. No. Generally each time I would change responsibilities I would do that.
Q. Okay.
MR NUNLEY: And for the record "do that" meaning sending your materials to central files.
THE WITNESS: Yes.
BY MISS BRACHTL:
Q. Have you ever given any lectures or presentations to anyone outside of Philip Morris about smoking and health?
MR NUNLEY: Objection.
BY MISS BRACHTL:
Q. Let me rephrase the question. Have you ever given lectures to anyone outside of Philip Morris on smoking and health?
A. No.
Q. Have you ever given any presentations to anyone outside of Philip Morris on smoking and health?
A. No.
Q. Have you ever given any lectures to

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anyone outside of Philip Morris on whether or not nicotine is addictive or habit forming?

A. No.

Q. Have you ever given any speeches to anyone outside of Philip Morris on whether or not nicotine is addictive or habit forming?

A. No.

Q. Have you ever made any presentations within Philip Morris on any affects that smoking might have on health?

A. No.

Q. Have you ever given any presentations within Philip Morris on whether or not nicotine is addictive or habit forming?

A. No.

Q. Have you ever been to any presentations on smoking and health?

MR NUNLEY: Before you answer could I just ask for your definition of "smoking and health"? I'm happy if you want to let the witness use his own, whatever that may be, but I think sometimes a lawyer's definition and a scientist's definition on that issue may be different.

MISS BRACHTL: Sure. When I talk about smoking I'm talking about inhaling a

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cigarette. When I talk about health I'm talking about health related problems of any sort.

MR NUNLEY: And the question is has he ever attended a presentation on smoking and health within Philip Morris.

THE WITNESS: Yes, I would say yes.

BY MISS BRACHTL:

Q. Tell me about those presentations if there's more than one?

A. The only one I could remember right now dealt with the effect of smoking with respect to nicotine on the peripheral nervous system.

Q. When was that presentation?

A. To the best of my recollection, about 1975 or 76.

Q. Who made that presentation?

A. Dr Alfred Berger.

Q. At the time Dr Alfred Berger made the presentation was he employed by Philip Morris?

A. No, he was not.

Q. By whom was he employed?

A. He was Professor Emeritus at the University of Virginia.

Q. To whom did Dr Berger make his presentation on the effects of nicotine on the

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peripheral nervous system?

A. To any interested people within the research centre at Philip Morris.

Q. How many people attended that?

A. I don't remember. Probably about 100.

Q. What did Dr Berger say?

A. He was talking about the complexities of how nicotine interacts with various different types of nerves and neuromuscular junctions within an organism.

Q. Did he say that nicotine produces some adverse effects on the peripheral nervous system?

MR NUNLEY: Objection as to form

BY MISS BRACHTL:

Q. You can answer it.

A. Not as such, no. He was more interested in talking about mechanisms of interaction. So it was a more technical presentation than...

Q. Do you personally have an opinion on whether or not smoking is hazardous to a human's health?

MR NUNLEY: Let me object, and I don't have a basis if we clarify this. You're asking now for his personal opinion?

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MISS BRACHTL: I am.

MR NUNLEY: You're not attempting to qualify him as an expert on the subject?

MISS BRACHTL: I'm certainly not. Well, no.

BY MISS BRACHTL:

Q. Go ahead.

A. Okay. Again before I answer the question, can I ask you what you mean by hazardous to your health.

Q. Sure. Danger could -- yes, dangerous.

A. Okay. My personal opinion is that smoking is what is called a risk factor or could conceivably increase risk for certain diseases involving the lung.

Q. Which diseases are you talking about?

A. Lung cancer, emphysema, COPD, chronic obstructive pulmonary disease.

Q. Do you believe that smoking does increase the risk of those diseases?

A. I believe that smoking could increase the risk of those diseases.

Q. Does that mean that you do not

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believe that smoking does increase the risk of those diseases?

MR NUNLEY: Objection. Argumentative.

THE WITNESS: That data rests on statistical grounds. Therefore to say that it does takes it to an individual basis. You cannot say for any one person whether it does or doesn't. You can only say that it can.

BY MISS BRACHTL:

Q. But don't you personally think that it does?

MR NUNLEY: Objection. Argumentative. That it does what?

BY MISS BRACHTL:

Q. That don't you personally think that smoking does pose a risk to health?

MR NUNLEY: Objection. Asked and answered.

BY MISS BRACHTL:

Q. You can answer it. I'm talking about what you personally believe, not about statistics or proof, but just don't you personally believe that smoking is risky to your health?

A. All right. Let me try to answer the

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question this way. Someone who makes a decision to smoke is certainly taking a risk. Now does that say that -- what I'm trying to distinguish is that smoking does -- if you say "does" that implies necessarily. If I'm saying "can" that implies that it may or it may not.

MR NUNLEY: Let the record reflect counsel is looking at the witness and shaking her head.

MISS BRACHTL: Right. I certainly am.

BY MISS BRACHTL:

Q. You don't have grandchildren yet, right?

A. No, I don't.

Q. If you were to have a grandchild would you prefer that that grandchild smoke or not smoke?

MR NUNLEY: Objection. Speculation.

BY MISS BRACHTL:

Q. You can answer.

MR NUNLEY: You have no obligation to speculate.

BY MISS BRACHTL:

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Q. You can answer.

MR NUNLEY: It's also an improper hypothetical and I object on that ground.

BY MISS BRACHTL:

Q. You can answer.

A. I think I would prefer the grandchild not smoke.

Q. Why is that?

A. Because, just as I would prefer the grandchild not to do sky diving, or not to engage in other risky behavior, it is a risky behavior.

Q. Okay. What's--

MR NUNLEY: Excuse me. Can I just clarify. When you say the grandchild, are you talking at the age of majority, at birth, what do you mean?

MISS BRACHTL: My question is as it stands.

BY MISS BRACHTL:

Q. Okay, would you prefer that you didn't smoke?

A. No.

Q. We've talked about FTR and the research that's done there. Strike that. Don't strike that.

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Some research on tobacco is done at Philip Morris in the United States, right?

A. Yes.

Q. And some research on tobacco is done at FTR, right?

A. Yes.

Q. Do you know how the decision is made where different kinds of research is done.

MR NUNLEY: Objection. Foundation.

THE WITNESS: Generally, just simply historical in nature.

BY MISS BRACHTL:

Q. Could you explain that, please?

A. Someone at Richmond will decide to do a project. He will do that project. Someone at FTR will decide to do a project. It will be approved and he will do that project. Only from time to time if somebody looks at the total situation and says, you know, we are seeing a lot of overlap, will the decision be made to cease a project here and have it only done in Richmond, or cease a project and have it only done in Neuchatel. But in general the projects are conceived of and carried out independently.

Q. Are you aware of any directive that

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certain research be done at FTR?
A. No.
Q. There's something called IMBIFO, right, I-M-B-I-F-O?
A. Yes.
Q. What is that, please, for the record?
A. It is a laboratory in Cologne, Germany.
Q. Is that a Philip Morris lab?
A. Yes, it is.
Q. Have you ever been there?
A. Yes, I have.
Q. Have you ever worked there?
A. No, I have not?
Q. For what reason have you gone there?
A. To visit, to hear presentations, to discuss on going research.
Q. How often have you been there?
A. Maybe a total of seven or eight times.
Q. Tobacco related research is done there, right?
MR NUNLEY: Objection as to form.
THE WITNESS: Research that is of interest to Philip Morris is done there.

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BY MISS BRACHTL:

Q. Can you tell me what kind of research that you are aware of that has been done there?

A. Research involving identification of metabaloids of nicotine. Research involving looking for biomarkers of nicotine, particularly nicotine in hair. Research involving pharmacology of nicotine. Research involving inhalation toxicology, particularly of smoke. Research involving bioassay development using bacterial bioassays. And research involving the fundamental pharmacology of certain smoke components.

Q. Just so that the record's very clear for whomever might be reading it, what do you mean by pharmacology?

A. What I mean by pharmacology is essentially the mechanism of action of any chemical on a human or none human, on an organism, it doesn't have to be on an-- on an organism.

Q. Can you describe what inhalation -- I believe you said there was research done there into inhalation or did you say?

A. Inhalation, yes.

Q. Okay. What kind of research,

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please?

A. Well two types, really. One is developing superior techniques for looking at exposure of animals to, you know, inhaling certain substances, and of course the second type is monitoring of cigarette smoke through inhalation, you know, on an animal experiment.

Q. And can you be more specific about the pharmacology of nicotine research that's done there?

A. I didn't say -- oh yes I did say pharmacology of nicotine, excuse me. You're quite right.

I'm not sure that work is still continuing but there was quite a bit of work that was connected with the nicotine analogue program where studies were done looking at certain compounds as well as nicotine, on the effect of these compounds on the peripheral nervous system.

Q. When was that?

A. It would be have been about 1976 to perhaps 84/5, and I'm not sure if work was continued after that.

Q. Was some research done on pharmacology of nicotine at IMBIFO? Were reports

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of that research sent to Philip Morris in the United States?

A. From time to time, yes.

Q. When you were in the Nicotine Analogue Program did you receive copies of reports of research that was being done on the pharmacology of nicotine at IMBIFO?

A. Yes, I did.

Q. Did you ever hear that research that Philip Morris -- strike that. Did you ever hear that research that Philip Morris didn't want to -- strike that. Did you ever hear that research Philip Morris wanted to keep secret should be done at IMBIFO.

MR NUNLEY: Objection as to form, and objection that it has no time frame.

BY MISS BRACHTL:

Q. As to time did you ever here that?

A. No.

Q. Did you ever hear that research that Philip Morris wanted to keep secret should be done at FTR?

A. No.

Q. Did you ever here anybody say in substance that it would be harder for American

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Plaintiffs to get access to research that was done at IMBIFO.

MR NUNLEY: Objection as to form.

THE WITNESS: What do you mean by hear?

BY MISS BRACHTL:

Q. Just anybody ever -- did you ever hear it in any way? In a newspaper, in conversation at the coffee shop?

A. Yes.

Q. Tell me what you've heard?

A. Simply sort of office gossip that there were people who thought that if research were done in Europe it might be more difficult to obtain the results of that research in litigation.

Q. Did you hear that in the United States or did you hear it when you were abroad?

A. In the United States.

Q. About what time frame was that that you heard such gossip?

A. In the 1970s.

Q. Okay. Did you ever participate in any discussions about that?

A. No.

Q. Do you know Helmut Wakeman.

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MR NUNLEY: Just for the record it's is Wakeham.

MISS BRACHTL: Thank you.

THE WITNESS: Yes.

BY MISS BRACHTL:

Q. How do you know him?

A. He was Vice President of Research and Development when I came to work at Philip Morris in 1973.

Q. Did you have a working relationship with him? By that I mean were you guys in the same chain of reporting?

A. With a long distance between us, yes.

Q. Why is that?

A. He was Vice President. I was a research scientist.

Q. Did you ever hear--

MR NUNLEY: By long distance you mean not geographically but on an organizational--

THE WITNESS: On organizational chart, yes.

BY MISS BRACHTL:

Q. Did you ever hear that he said that IMBIFO was a locale where Philip Morris might be able to do some things that they were reluctant to

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do in this country?

A. No.

Q. Did you ever hear anything like that.

MR NUNLEY: Objection as to form.

THE WITNESS: I'm trying to think. Again, I may have heard something like that.

BY MISS BRACHTL:

Q. Just sort in general office gossip?

A. General office gossip.

Q. I'm going say something now and I don't mean to characterize your testimony. Whatever you said, you said, but I think you said something like there was general office gossip that -- strike that. Did you ever hear anything like it would be easier to keep information out of the hands of the anti-smoking people if it was done overseas?

MR NUNLEY: Objection to form.

THE WITNESS: No.

MR NUNLEY: Dr Sanders, if you will give me just a moment after Miss Brachtl finishes her question I may have an objection.

BY MISS BRACHTL:

Q. Have you ever heard that nicotine

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is addictive?

MR NUNLEY: Objection as to--

MISS BRACHTL: Ever. I am sorry. I interrupted you. I apologize. Go ahead.

BY MISS BRACHTL:

Q. Did you ever in your life hear that nicotine is addictive?

A. I have heard people say that, yes.

Q. When did you first hear it?

A. I couldn't tell you.

Q. You couldn't tell me?

A. I'm sure many years ago.

Q. There have been in depth studies done, regardless of whether or not you agree with them, that have reported nicotine is addictive, right.

MR NUNLEY: Objection. I'd like you to be more specific about the studies.

BY MISS BRACHTL:

Q. I'm just asking now whether you aware of studies that have been done that show that nicotine is addictive?

MR NUNLEY: Objection. Vague.

THE WITNESS: I may -- oh, go ahead.

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MR NUNLEY: You can answer.

THE WITNESS: I need to point out that I'm not an expert in this area.

BY MISS BRACHTL:

Q. This area being?

A. Nicotine, the psychology of nicotine addiction, etcetera, pharmacology. I'm a chemist, not a pharmacologist. I am certainly informally aware of those studies. I have not read those studies and could not comment on those studies as an expert.

Q. Thank you. Let's be very, very clear. I'm not examining you as an expert in nicotine. I'm just examining you as Dr Sanders in the realm of what it is that you know. So my question is -- I think you answered my question.

Are you aware that the American Psychiatric Association has cited studies and said that nicotine is addictive?

A. Not as such that it's the American Psychiatric Association.

Q. Are you aware that the American Psychological Association has done studies and cited studies and said that nicotine is addictive.

MR NUNLEY: Objection. Compound.

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BY MISS BRACHTL:

Q. Thank you. Let me rephrase my question. Are you aware that the American Psychological Association has cited studies and concluded that nicotine is addictive?

A. Not as such that it was the American Psychological Association.

Q. Are you aware that the Royal Society of Canada has cited studies and said that nicotine is addictive?

A. No, definitely not.

Q. How about the World Health Organization? Are you aware that the World Health Organization has cited studies and concluded that nicotine is addictive?

A. Again, not as such, as necessarily knowing it was the World Health Association (sic).

Q. Are you aware that the American Medical Association has cited studies and said that nicotine is addictive.

MR NUNLEY: Objection to the characterization of "studies."

MISS BRACHTL: I need to understand your objection. What are you objecting to? What characterization?

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MR NUNLEY: I think the studies that you have reported are complex studies. I don't know that they can be accurately summarized in the course of one sentence.

BY MISS BRACHTL:

Q. Well I'm just saying are you aware they cited studies and concluded that nicotine is addictive?

MR NUNLEY: Same objection.

BY MISS BRACHTL:

Q. You can answer my question?

A. I am aware that the American Medical Association has taken a position on that issue.

Q. Well are you aware the American Medical Association has said that nicotine is addictive?

A. I'm aware of that.

Q. Are you aware of any research that Philip Morris has done that refutes these conclusions?

MR NUNLEY: Well on that point I think it does call for expert testimony.

MISS BRACHTL: No, I...

MR NUNLEY: Let's have one understanding, Miss...

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MISS BRACHTL: Brachtl.

MR NUNLEY: Brachtl, thank you. You're here as counsel both for Arch and for either Frosina cases, correct?

MISS BRACHTL: I'm here -- well, more than that; I'm here for all the New York cases.

MR NUNLEY: I understand, but the deposition basically is being taken by you and defended by me. So, Mr Shub, I don't know that we need to have second chairing ought to be on the record. If you want to say something please say it to your co-counsel so we have one attorney for the defence, one attorney for the Plaintiffs.

MR SHUB: I don't know anything I've said that prompted that response. Let me just say--

MR NUNLEY: You may, if you want to be on the record--

MR SHUB: They can pick me up on the mike because I'm not going to be on the record except to respond. As you know in certain instances in Arch we've had two attorneys taking depositions and therefore it would not be improper for me to ask questions of the witness.

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I understand your suggestion that one attorney examine at a time and we're going to honor that suggestion, but that it would not be improper, nor have we ruled out the possibility, that I won't say anything to Dr Sanders during the course of this deposition.

MR NUNLEY: In what deposition in Arch have you had two Plaintiff's counsel taking the deposition?

MR SHUB: Time is short. We are running short and I can tell you right now that we did it at a deposition that you attended I believe at Dr McEwan's deposition where Mr Douglas and I both conducted examination with Mr While's permission. But let's not belabor this. I don't think it's going to happen today.

MR NUNLEY: For the record I don't believe I was at McEwan.

MR SHUB: Oh, you weren't there? Okay. Anyhow we did it there, but time is short, so go ahead Miss Brachtl.

BY MISS BRACHTL:

Q. Has Philip Morris done any research that refutes these studies?

A. I would be glad to answer the question and

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the answer would be rather long. I wonder if I could ask your permission, it is almost 50 minutes, it's been about 48 minutes since we started, if I could take a short break.

Q. Actually in that a question is pending, I would prefer that you answer this question. I mean, procedurally the way we do it is we don't take a break while a question's pending.

A. That's fine.

Q. So the question is whether Philip Morris has done any research that refutes these studies?

A. All right. Before I answer that question we now must get into the problem of definitions because the definition of addiction is neither standard, simple or universally agreed upon. And either I need to ask you how you define addiction or I need to define it.

Q. Let's hear your definition?

A. As I said before, I am neither an expert nor a pharmacologist, but when I was in school, and shortly after, and, you know, spoke to scientists and did reading outside of my own field, the definition of addiction at that time and one that I have already liked is that to be

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addictive the substance, first of all, must have some physiological effect that creates some type of dependence. Secondly, there must be, the individual once dependent must continually increase the dose in order to receive the same effect. And, thirdly, if the material or substance is withdrawn there is a very striking physiological withdrawal -- I've lost the word I want -- reaction.

If we use that definition, then Philip Morris has done research to essentially refute that nicotine is addictive.

Q. Let's go ahead and break.

Off the record at 1225 p.m.

On the record at 1241 p.m.

EXAMINATION:

BY MISS BRACHTL: (Continued)

Q. Dr Sanders, the definition you just gave for addiction, have you ever discussed that definition with anybody at Philip Morris?

A. No, I never have.

Q. You've never discussed that definition with anybody at Philip Morris?

A. No, I never have.

Q. Have you ever seen that definition

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or a facsimile of it in writing?
A. Yes.
Q. Where have you seen that in writing?
A. I couldn't tell you. I couldn't remember.
Q. When did you see it in writing?
A. I couldn't remember.
Q. Did you see it in writing more than once?
A. Yes.
Q. But you have no idea where or when?
A. No.
Q. The Surgeon General, in 1988, said that nicotine is addictive, right?
A. I don't know.
Q. You don't know that?
A. No. As I've said before I'm not at all an expert in this area.
Q. Did you ever hear that the Surgeon General said that nicotine is addictive?
A. Not that I know of, quite truthfully.
Q. So this definition of addiction is just something -- strike that.
Do you know where you got this definition of addiction?

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A. No. From a textbook, I'm sure, but I don't remember what textbook and I don't remember when.

Q. Well when you say that Philip Morris has done research to dispute the findings that nicotine is addictive, you're using your own definition of addictive that you just gave us, is that right?

MR NUNLEY: Objection to the characterization of the prior testimony and foundation for the question.

THE WITNESS: If I heard you correctly, you said that Philip Morris was doing research to dispute the findings that nicotine was addictive. During the period of time when that research was done those findings had not been made.

BY MISS BRACHTL:

Q. Ah, thank you. That's helpful.

A. Based on your indication of dates.

Q. When did Philip Morris do research into whether nicotine is addictive.

MR NUNLEY: Objection as to the characterization of the research.

THE WITNESS: The research that Philip Morris did was not so much a question of

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determining or disproving that nicotine is addictive or determining the addictive properties of nicotine. It was basic research looking into how one might characterize the effect of nicotine on the central nervous system, and that research was done from about 1978 to about 1983.

BY MISS BRACHTL:

Q. Okay and this is research to determine the affects of nicotine on the central nervous system, is that right?

A. Yes.

Q. Who was involved in that research?

A. Primarily Dr Vic DeNoble and Dr Paul Mele.

Q. Did you have anything to with that research?

MR NUNLEY: Objection as to form.

THE WITNESS: Dr Vic DeNoble had two projects, both of which involved nicotine on the central nervous system. One dealt with occasionally assessing the affect of nicotine analogues on the central nervous system, which I did have something to do with. The other dealt with how one might characterize in psychopharmacological terms nicotine interaction with the central nervous system, which I did not

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have anything to do with.

Q. Dr DeNoble found, did he not, that nicotine is a reinforcer?

A. That is the word that Dr DeNoble used, exactly; reinforcer.

Q. Am I correct in understanding your testimony that after 1983 Philip Morris did no research investigating whether nicotine is a dependence producing substance.

MR NUNLEY: Objection. Characterization of the prior testimony and foundation.

BY MISS BRACHTL:

Q. Let me withdraw the question and ask it differently. Are you aware of any research that Philip Morris did after 1983 examining whether nicotine is a dependence producing substance?

A. I am not aware of any such research.

Q. Are you aware of any research that Philip Morris did after 1983 to investigate whether or not nicotine is addictive?

A. I am not aware of any such research.

Q. Are you aware of whether Philip Morris contracted with any outside entity to do

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research into either of those areas?
A. I am not aware of any such research.
Q. Tests have been done and reported after 1983 that demonstrate that nicotine is addictive? Has Philip Morris--
MR NUNLEY: Objection.
BY MISS BRACHTL:
Q. Strike that. Has Philip Morris done anything after 1983 to refute the findings of studies that demonstrate that nicotine is addictive.
MR NUNLEY: Objection. I move to strike the earlier statement of counsel. You may answer the question.
THE WITNESS: Again, to answer that question we have to still be very careful about what definition of addiction we are using. The answer to the question is no, in any event.
BY MISS BRACHTL:
Q. Thank you. Other than any work done by Dr DeNoble or Dr Mele are aware of any research that Philip Morris has done into the question of whether nicotine is addictive?
A. No, I'm not.
Q. Other than any research done by

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Dr DeNoble or Dr Mele are you aware of any research that Philip Morris has done into the question of whether nicotine produces a dependence?

A. No, I am not.

Q. Are you aware or any research that Philip Morris contracted with an outside entity to do to examine whether nicotine is addictive?

A. No, I am not.

Q. Are you aware of any research that Philip Morris contracted with an outside entity to perform about whether nicotine is a dependence producing drug?

A. No, I am not.

Q. You're familiar with the Council for Tobacco Research, correct?

A. Yes.

Q. Do you know whether the Council for Tobacco Research ever contract -- strike that. Are you aware of whether the Council for Tobacco Research ever sponsored any research into whether nicotine is addictive?

A. No, I am not.

MR NUNLEY: Your prior question, you said "are you familiar with". I don't know

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how far you want to pursue this line of question of questioning as to CTR but if you are I'd appreciate it if you would just flesh out what you mean, or what the witness means by "familiar with".

MISS BRACHTL: Okay. If I said that I wasn't sufficiently precise. Thank you. Let me re-ask that question.

BY MISS BRACHTL:

Q. Are you aware of any research that the Council for Tobacco Research sponsored into whether nicotine is addictive.

MR NUNLEY: That question was fine. What I was asking was that earlier question his familiarity with CTR in general. I don't know whether you mean just does he know about, did he work with them, whatever.

MISS BRACHTL: All I mean by that, counsel, is do you know what the CTR is.

MR NUNLEY: Thank you.

BY MISS BRACHTL:

Q. Now what I am asking is whether you know of any research that was sponsored by CTR into whether nicotine produces dependence?

A. I am not aware of any such research.

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Q. Do you understand that I'm not asking you -- when I'm asking you, "do you know of," I'm just asking do you know whether any was done. I'm not asking if you are familiar with great detail?

A. Yes.

Q. Do you understand that?

A. Yes. I understand the question and I do not know whether any research was done or not.

Q. You have heard discussion at Philip Morris, have you not, about the controversy over whether nicotine is addictive?

A. Can you define exactly what you mean by that question?

Q. Sure. Let me withdraw it. There have been allegations made in litigation recently that nicotine is addictive. You know that?

A. I'm aware of that, yes.

Q. And have you heard discussion of that at Philip Morris?

MR NUNLEY: You mean outside, obviously, meetings with counsel the allegations may have been discussed?

MISS BRACHTL: Right.

BY MISS BRACHTL:

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Q. I always want you to exclude from your answer anything that you've discussed with counsel. Let me be clear. Look, it's been in the newspapers, it's been everywhere that people are saying that nicotine is addictive, and I'm just trying to find out whether Philip Morris were talking about that?

A. Yes, they were discussing it.

Q. Would it bother you if you found out that a company that you were working for sold an addictive drug?

MR NUNLEY: Objection as to form. It's an improper hypothetical and it calls for speculation.

BY MISS BRACHTL:

Q. You can answer that.

A. Again, what do you mean by "addictive".

Q. I mean addictive in it's broadest sense. Addictive as the way a person understands it. Addictive as we think of addictive.

MR NUNLEY: Well objection. I don't think you can ask him to speculate whether the lay person understands it.

THE WITNESS: Well, I'd be glad to answer that question. A lay person will attribute

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or use the word addiction for many things. Television is addictive, candy is addictive cookies are addictive, chocolate is addictive, desserts are addictive. If you ask the question in that way then I can say quite truthfully, no, I would have no problem at all working for a company that produces something that is called addictive.

BY MISS BRACHTL:

Q. If there were a substance that had been determined by the United States Surgeon General and the vast majority of highly respected medical organizations in the United States to be addictive, would you have a problem working for a company that sold such a substance?

A. What definition did the Surgeon General use for the term "addiction"?

Q. Can you just answer the question?

A. No, I cannot just answer the question.

Q. You don't understand that question, is that what you're saying?

A. I don't understand the question because I need to know the exact definition that the Surgeon General used and I am not an expert in the field. If we want to use my definition of

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addiction then I would say, yes, it would bother me to be working for a company that produced something that was addictive by my definition. My understanding is Surgeon General did not use that definition to decide that nicotine was addictive.

Q. If the Surgeon General and the American Psychiatric Association and the American Psychological Association, and the World Health Organization and the American Medical Association all said that a substance sold by a company you worked for was addictive, would you want to know what definition they were using?

MR NUNLEY: Objection. Compound.

BY MISS BRACHTL:

Q. Answer. You may.

A. Yes, I -- and I have read the definition but I could not tell you what that definition is off the top of my head. I don't feel uncomfortable about working for the company I work for because by that definition it has been also determined by expert bodies that caffeine is addictive. I do not see people worrying about the fact that caffeine is addictive. That definition clearly includes caffeine and it has been said so by experts in the field, which I am not.

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Q. Does caffeine kill people?

MR NUNLEY: Objection. Argumentative.

BY MISS BRACHTL:

Q. You can answer. Actually I'll rephrase that. Have you heard reports that caffeine kills hundreds of thousands of people every year?

A. No, I have not.

Q. But you have heard reports that nicotine and tobacco kill hundreds of thousands of people a year, right?

MR NUNLEY: Objection, compound. You want to know the reports that nicotine has killed?

BY MISS BRACHTL: Thank you.

Q. You have heard reports that tobacco has killed hundreds of thousands of people every year, right?

A. I have not heard reports that tobacco has killed. I have heard reports that -- you used the word tobacco.

Q. That smoking has -- all right. Thank you. You have heard reports, have you not, that smoking kills hundreds of thousands of people

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each year?
A. I have heard such reports, yes.
Q. Why do you disagree with the Surgeon General's definition of addiction?
A. Because it is too broad. Because it includes too many things. It tends to trivialize the meaning of the word addiction.
Q. So what other things that it includes do you think are too broad?
A. It would clearly, as I say, include caffeine which has already been established and stated. And it would include virtually any type of behavior that one could describe as being reinforcing, compulsive, that also in turn might have some sort of negative implications for health attached to it.
Q. Such as what? It's my understanding that you don't agree with the Surgeon General's because it includes too many things such as caffeine. What else?
MR NUNLEY: Miss Brachtl, I'm going to object to this. Dr Sanders is an organic chemist. We have brought him from Switzerland for deposition. You have come, as I have, from the United States. The questions you are asking now

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and have been for the last series I think are expert questions for someone who is an expert in physiology or pharmacology. I'm not going to stop you from asking these questions but I'm going to put you on notice that at trial I will move to exclude them, and if you choose to take your time today asking these questions that's your choice but I do want to put you on notice that questions of this type that clearly go to matters outside this witness's expertise I think are objectionable and will be subject to exclusion at trial.

MISS BRACHTL: Thank you.

BY MISS BRACHTL:

Q. You can answer my question?

A. I would think that by that definition that, for instance, high sugar foods might be included. I would think by that definition high fat foods might be included. I would think that by that definition compulsive over eating would be included.

Q. Do you agree that nicotine is a powerful psychoactive agent?

MR NUNLEY: Objection, calls for expertise outside the witness's area.

THE WITNESS: Again, what do you

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mean by psychoactive agent?
BY MISS BRACHTL:
Q. What is your understanding of the meaning of the word psychoactive?
A. It's not a term I would use, so I'm not sure I can answer the question. Would I agree that nicotine has an effect on the central nervous system, yes.
Q. But you don't understand what psychoactive means?
A. I'm not sure what it means, no.
Q. Are you familiar with the test that the Surgeon General, the criteria that the Surgeon General used in reaching the conclusion that nicotine is addictive?
A. As I said before, I have read that criteria. I do not remember it and I could not repeat it because, as I said before, I'm not an expert.
Q. It's true, isn't it, that nicotine has no flavor?
A. No, that is not true.
Q. Nicotine does have a flavor?
A. Yes.
Q. How do you know that nicotine has a

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flavor?
A. There have been a number of studies done, most of which were done outside of Philip Morris, and there are a number of articles in the literature which discuss that.
Q. Nicotine has no odor, does it?
A. Nicotine also has an odor. That I can witness to from my own work because I've worked with nicotine in the laboratory and is does have a characteristic odor; very faint but definitely characteristic.
Q. Did you ever hear any discussion at Philip Morris that Philip Morris should do some research to determine whether or not nicotine is addictive?
A. After 1983 I cannot think of -- I am not aware of any such discussion.
Q. So am I correct that you've never heard anybody after 93 (sic) at Philip Morris say, "We should have some research done to find out whether or not nicotine is addictive," is that right?
A. That's correct.
Q. Are you aware of any documents generated at Philip Morris that say that nicotine

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is not addictive.

MR NUNLEY: Objection, foundation, speculation.

THE WITNESS: I'm trying to think whether I've seen documents to that effect but I'm not sure.

BY MISS BRACHTL:

Q. Do you think you may have?

MR NUNLEY: Objection. Do you mean documents that specifically use that language, "nicotine is not addictive," or do you mean in form or substance, words or substance?

MISS BRACHTL: Thank you. I'll start with that language exactly.

THE WITNESS: I don't -- I'm not sure.

BY MISS BRACHTL:

Q. Have you ever seen any documents at Philip Morris that say that, in substance, that nicotine is not addictive?

A. I'm not sure.

Q. Do you think you may have?

A. I may have.

Q. Do you have a vague recollection that you may have?

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A. I'm not sure.

Q. What makes you think that you may have?

A. Because that was the conclusions of Dr DeNoble's research. I'm just not sure if I saw it in document form.

Q. Okay, outside of Dr DeNoble's research did you ever see anything at Philip Morris that said in words or substance that nicotine is not addictive?

A. No.

Q. You have explained to us why you disagree with the Surgeon General's finding that nicotine is addictive. Have you heard any discussions at Philip Morris about the Surgeon General's finding that nicotine is addictive?

A. No.

Q. And you are aware, are you not, that Philip Morris has been sued by Plaintiffs alleging that nicotine is addictive?

A. Yes.

Q. Never tell me anything that your counsel has told you. Have you heard any discussion at Philip Morris about the law suits alleging that nicotine is addictive?

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A. Coffee time discussion, lunchtime discussion, that's all.

Off the record at 1.04 p.m. to change video tape.

On the record at 1.08 p.m.

EXAMINATION:

BY MISS BRACHTL: (Continued)

Q. Describe for us, please, the coffee table conversations that you heard about the litigation which alleges that nicotine is addictive?

A. Most of it focuses around the fact that how can something be addictive when, you know, a lot of people are able to just quit smoking. So how can one characterize that as, you know, cigarettes as being addictive. But as I say, it's non-scientific, non-expert, and just, you know, lunchtime conversation.

Q. And you never heard anybody say, "We should do some research to find out whether it's addictive"?

A. As I say, not since 1983.

Q. Thank you. Is it your understanding that nicotine's effect on the central nervous system contributes to smoking pleasure?

MR NUNLEY: Objection, calls for

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opinion testimony from an expert that's outside this witness's expertise.

BY MISS BRACHTL:

Q. Go ahead.

A. Yes. I have to think about that for a few seconds. (Pause) I'm not sure that I can answer that question.

Q. Why is that?

A. There is no question that nicotine has an effect on the central nervous system. No, I would think I would have to answer that question -- okay, repeat the question for me. I'm sorry to be difficult on this one.

Q. You are not being difficult at all and you should always tell me if my question is unclear. Is it your understanding that nicotine's effect on the central nervous system contributes to smoking pleasure?

MR NUNLEY: Same objection.

THE WITNESS: If you had said the question do I think that nicotine contributes to, you know, why people enjoy smoking I could comfortably answer yes. I'm not sure what one means by smoking pleasure, but...

Q. Oh, okay, all right. But you think

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that nicotine contributes to why people enjoy smoking?

A. Yes.

Q. And you agree, don't you, that nicotine has adverse effects on the peripheral nervous system.

MR NUNLEY: Objection as to form.

THE WITNESS: That's an interesting question. I agree that there has been a great deal of discussion in the literature about nicotine's negative effects on the peripheral nervous system. However, when I suggested many years ago that we try to quantitate these effects and I talked to the one person at Philip Morris who is an expert in the area, he said that for the vast majority of people the effect is negligible.

Q. Who was that?

A. His name was Frank Ryan.

Q. When was that conversation you had with, is it Mr Ryan?

A. Yes, it's Mr Ryan. It probably would have been 1975 or 76.

Q. Mr Ryan is a behavioral psychologist?

A. Yes, he was a behavioral -- no -- yes, he

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was a behavioral psychologist.

Q. Is he a medical doctor?

A. No.

Q. So do you know on what he based his opinion that the effects of nicotine on the peripheral nervous system are negligible?

MR NUNLEY: Objection, speculation.

BY MISS BRACHTL:

Q. I'm asking do you know?

A. It was my understanding, I don't know for a fact, but it was my understanding he had done some research into that question.

Q. He, a behavioral psychologist, had done research on nicotine's effect on the peripheral nervous system?

A. Yes that was my understanding.

Q. Do you know anything about that research?

A. No.

Q. Well do you agree that one effect that nicotine has on the peripheral nervous system is it causes an increased heart rate?

A. I have heard that.

Q. Do you know if it's true?

A. I think it's true for some people. I don't

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think it true for everybody. I know it isn't true for me, for example. I have had it tested.

Q. It's true also, isn't it, that nicotine affects the peripheral nervous system by causing increased blood pressure.

MR NUNLEY: Objection as to form. You said, "it's true also". I'm not sure that properly characterizes, to the extent you meant to, his answer to your question.

BY MISS BRACHTL:

Q. Let me rephrase my question. It's true is it not that an effect that nicotine has on the peripheral nervous system is to cause increased (Loud coughing from one counsel) blood pressure?

A. I think that is true for some people.

Q. Let me ask the question again. I think it was obliterated. It's true, isn't it, that an effect that nicotine has on the peripheral nervous system is to cause increased blood pressure?

A. I think that is true for some people.

Q. Was it your understanding that -- strike that. That's true for most people, isn't it?

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A. I don't know that it's most people.
Q. Do you know whether it is or not?
A. No, I don't know.
Q. Okay?
A. Again, I know it's not true for me, for example.
Q: Did there come a time when it was your understanding that Philip Morris wanted to discover or create a compound that would have a nicotine-like effect on the central nervous system without undesirable effects on the peripheral nervous system?
MR NUNLEY: Objection to characterization.
THE WITNESS. Yes.
BY MISS BRACHTL:
Q. And was that a goal of the Nicotine Analogue Program?
A. Yes.
Q. I believe your testimony was that the Nicotine Analogue Program began before you came to Philip Morris. Have you heard whose idea nicotine analogues were?
A. It was my understanding the idea of the program was Dr Osdene's.

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Q. Was there a budget allotment for the Nicotine Analogue Program?
A. I don't know.
Q. Have you ever heard of a Richmond Meeting?
A. Yes.
Q. What is that?
A. It was the name given to monthly meetings where members of the New York Management Group of Philip Morris, USA, were given presentations on the current status of R & D projects.
Q. Did you go to those Richmond meetings?
A. Occasionally.
Q. A goal of the Nicotine Analogue Program was to find a substance that preserved nicotine's effect on the central nervous system. What effect was that?
MR NUNLEY: Objection. I don't think that properly states what the goal was.
BY MISS BRACHTL:
Q. Go ahead.
A. Yes, the wording you used before was the goal was a compound that gave effects that were similar to nicotine.

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Q. Thank you.
A. Which I feel more comfortable with.
Q. Thank you. What effects were those?
A. At the time no one had a notion of what effects those were. It was simply that there was enough evidence to indicate that there was an effect but it was difficult to characterize the effect in any scientific way.
Q. How did you know it was an effect that you wanted to reproduce if you didn't know what it was?
A. You asked me the question earlier did I believe that smoking contributed, that nicotine contributed to people's enjoyment of smoking and I said I agreed with that. That was relatively well understood. The mechanism of what that is still is not known to this day.
Q. Are the receptors in the brain key to nicotine's effect as a reinforcer?
MR NUNLEY: Objection. Which receptors? And also objection, I think this calls for testimony outside the witness's expertise and it is expert testimony.
BY MISS BRACHTL:

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Q. Let me rephrase that. Was it your understanding when you were working on the Nicotine Analogue Program that certain receptors in the brain are key to nicotine's function as a reinforcer?

A. It is current understanding today of pharmacologists that any effect a chemical substance has in an organism is mediated through a receptor. Therefore the assumption would be that there are receptors in the brain which are affected by nicotine which caused in turn some end effect.

MR NUNLEY: Dr Sanders, she asked you, I think, at the time you worked on it did you have that knowledge then.

THE WITNESS: Not in 1973 but by 1975, yes.

BY MISS BRACHTL:

Q. Okay, and I need to be a little more specific. Was it your understanding then that nicotine's reinforcing effect was mediated through receptors in the brain.

MR NUNLEY: Objection as to form.

THE WITNESS: It was a logical assumption, given the current, you know given at

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that time and still today the state of, you know, pharmacological thinking.

BY MISS BRACHTL:

Q. In developing a nicotine analogue, was it, as head of the Nicotine Analogue Group, one of your desires to preserve nicotine's reinforcing effect. Strike that.

You were head of the Nicotine Analogue Group?

A. Yes.

Q. Was it your desire in coming up with a nicotine analogue that that analogue have a reinforcing effect?

A. No, because I didn't even know what a reinforcing effect was until probably round 1981 or 1980. It was simply an assumption that there was an effect, that there was a receptor and to try to guess as what that receptor might be and then model the system somehow.

Q. When you say it was an assumption that there was an effect, do you mean it was an assumption that there was a reinforcing effect?

A. I wouldn't have used that term--

Q. Okay.

A. -- just there was an effect.

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Q. Well...
A. I wouldn't have been able to define it any better than that.
Q. Define for us now, then, reinforcing?
A. As best I can, because again that's out of my area of expertise. It's essentially a type of behavior that gives an organism some type of reward and they would like to continue it.
Q. Was it your understanding during your work on the Nicotine Analogue Program -- strike that. Was it your desire during work as head of the Nicotine Analogue Program that a nicotine analogue would produce the effect on the smoker of giving a reward that would make the person want to do it again?
A. Again, I don't really want to sound difficult here but I'm a chemist.
Q. I understand?
A. I think as a chemist. So therefore my desire -- I wasn't really concerned about the smoker or reinforcing or anything, my desire was to find a receptor in the brain that I could isolate and use and find a chemical that had the same effect on that receptor, or similar effect on

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that receptor, as nicotine.

Q. Okay, and--

A. That's how my thinking goes. I'm not trying to be difficult.

Q. And the effect that you are talking about is the effect of, you do it, it makes you feel good and so you want it again?

A. No. The effect might be what we call a K-max; it might be a K-V. Simply, does it complex with that receptor, using the same kinetics and the same strength as nicotine. And that's as far as my thinking could go. That I understand. And to take it from there to something else is really out of my area of expertise and I would never think that way, and I'm not being deliberately difficult.

Q. I'm afraid that we're talking apples and oranges and we're getting caught up in technical terms and names for things?

A. That often happens.

Q. I would like to try and undo that and just talk simply. During the time you worked on the Nicotine Analogue Program did you have an understanding that one effect of nicotine was that it gave the smoker some sort of a behavioral

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reward that made the smoker want to do it again.
A. Yes.
MR NUNLEY: If you're going to follow this line of questioning I'd like to have some idea of the time frame. He said he was in it for six years.
MISS BRACHTL: I'm sorry?
MR NUNLEY: He said he was in the program for six years.
BY MISS BRACHTL:
Q. The understanding that we have just described is that something you had throughout the time that you worked on the Nicotine Analogue Program?
A. Yes.
Q. Thank you. And one of the goals of the Nicotine Analogue Program, you have testified earlier, was to produce nicotine-like effects on the central nervous system?
A. Yes.
Q. And is the effect that we have just been talking about, that effect being it gives the smoker a reward that makes a smoker want to do it again, is that one of the effects that you were trying to replicate with the nicotine analogue.

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MR NUNLEY: Asked and answered.

THE WITNESS: I really can't answer that question.

BY MISS BRACHTL:

Q. I don't understand why. Please tell me why?

A. Let me try to explain.

Q. Thank you?

A. There are probably numerous different receptors than nicotine can interact within the brain. I don't know which one, or which ones, might be responsible for the effect you're talking about. No one knows still to this day. Much less was even know in that period of time.

So all I could do was to try and pull a receptor from the central nervous system, in a model system, you know, in vitro almost, that nicotine would interact with. I might have pulled the wrong receptor, I don't know, so I couldn't possibly aim for that far down the road. All I could look was in the laboratory, something that behaved similar on a given central nervous system receptor.

Q. Yes, and the similar behavior that you were looking for -- you've testified earlier

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that it was your understanding that nicotine produces some sort of pleasurable effects, right, and you were trying, in developing a nicotine analogue, the purpose of which was to get rid of the bad peripheral nervous system effects, to preserve the good effects on the CNS, right?

A. You're using again "good" as a qualitative term which I would not necessarily accept.

Q. Okay.

A. So the effect's on the CNS.

Q. Isn't it true that one of the effects that you were trying to reproduce with the nicotine analogue was the effect that smoking the cigarette with the nicotine analogue would give the smoker a behavioral reward which would make them want to do it again?

MR NUNLEY: Objection.

THE WITNESS: I would say that was true. That was the ultimate goal of the program.

BY MISS BRACHTL:

Q. Okay.

A. But at the stage we were at it was too far down the road to use that as the goal for what I was doing. There were too many unknowns to say that was a reasonable goal.

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Q. Okay, but was that something -- at what point did that manifest as a goal to you?
A. We never got far enough in the program that that was a rational goal.
Q. But that is something all along that in preserving nicotine's pleasurable effects you would want to preserve. Is that right?
A. As I say, in giving something that would also provide some reward to the smoker that would have been something that would wanted to have been preserved, yes. That was the ultimate goal.
Q. Thank you. In the Nicotine Analogue Program were there other tobacco components that you tried to synthesize other than nicotine?
A. In the Nicotine Analogue Program we synthesized many, many compounds, not nicotine, many, many compounds, none of which, or almost none of which, were natural to tobacco.
Q. How many were there?
A. Over a hundred.
Q. Is there a list of them some place? Strike that. Was there ever a list that you saw?
A. Yes.
Q. Who prepared that list?
A. I did.

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Q. Did it go to central filing?
A. I assume so. I don't know for sure.
Q. Do you know for what purpose you created that list?
A. To be able -- for the people who were involved in the program, the number got so big it was no longer possible to keep all the results and data in one's head. It was necessary to have a list of the compounds and a list of the various results of the pharmacological testing that would be done, so that it was easy to try and draw conclusions from what direction, in terms of what direction we were going and what we had accomplished.
Q. Do you know whether any of the compounds that were synthesized in this program were ever used in cigarettes that were sold commercially?
A. They were definitely not used.
Q. None of them?
A. None of them.
Q. Do you know why?
A. Several reasons. First of all, none of the compounds that we synthesized would have been particularly desirable as tobacco additives.

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Secondly, it was very difficult to get the company to add any new compound to tobacco, no matter what.

Q. Do you know whether any of the compounds that were synthesized during the Nicotine Analogue Program were given to any humans to smoke?

MR NUNLEY: Objection as to form. Do you mean as part of a cigarette--

MISS BRACHTL: Yes, thank you.

MR NUNLEY: -- or individually?

THE WITNESS: There were, I think, three compounds, two of which were natural minor tobacco alkaloids which were smoked by three people, myself and two very experienced smokers from the flavor development department.

BY MISS BRACHTL:

Q. What were those compounds?

A. One was nornicotine which is a minor alkaloid, and I frankly don't remember what the other two were.

MR NUNLEY: Did you say "nor"?

THE WITNESS: Nornicotine.

BY MISS BRACHTL:

Q. If I could go through the documents

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relevant to this portion of the deposition, we could finish it in 20 minutes. Would you like to do that or would you prefer to eat now?

A. Let's go and finish this part

Q. Thank you. Let's take a break for just a minute so we can pre-mark them. It will save time.

Off the record at 1.29 p.m.

On the at 1.39 p.m.

EXAMINATION:

BY MISS BRACHTL: (Continued)

Q. Dr Sanders you have before you some documents that we've marked as exhibits. I'm going to ask you some questions about them. I think you don't need to read them to answer my questions, but if you want to you just say so and we'll take a break and let you read them. All right.

Starting with the document we've marked as Sanders 1. It doesn't have a title on it. I wonder if you've ever seen this before?

A. To my knowledge I have not seen that before.

Q. Thank you. Do you have any idea who authored the document?

A. Yes.

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Q. Can you tell me, please?

MR NUNLEY: Objection to the form.

THE WITNESS: My opinion would be this document was authored by Dr Victor DeNoble

BY MISS BRACHTL:

Q. Okay. Do you have any idea when the document was written?

A. I notice that he was talking about results in the 1980 to 1981 time frame, therefore I assume this document was written in 1981 or 1982.

Q. Thank you. Look, please, at page 2 of the document under 1D, subcaption "Nicotine Analogues". He states as a research objective as follows: "Determine if behaviorally active nicotine analogues can be directly substituted for nicotine in rats for which nicotine is functioning as an intravenously delivered positive reinforcer."

Is it your understanding that that was a research objective of the Nicotine Analogue Program?

A. It was certainly a research objective of Dr DeNoble and Dr Seeman.

Q. Did Dr DeNoble and Dr Seeman work under you in the Nicotine Analogue Program?

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A. Dr Seeman did.

Q. My question is whether or not this was a research objective of the Nicotine Analogue Program?

A. I would say--

MR NUNLEY: Excuse me. Can you be more specific? What portion of that are you referring to?

MISS BRACHTL: The portion that I read. I read 1D.1. "Determine" whether or not "behaviorally active nicotine analogues can be...substituted for nicotine in rats for which nicotine is functioning as an intravenously delivered positive reinforcer."

My question is, to the doctor who was head of the Nicotine Analogue Program, whether this was a research objective of the Nicotine Analogue Program.

THE WITNESS: At this time, I was Manager of the Division. Dr Seeman had become Director of the Nicotine Analogue program. So what I said was Dr Seeman's objective--

BY MISS BRACHTL:

Q. Oh, thank you--

A. --one could say that it was the objective

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of the program.

Q. Thank you. Was it also your understanding that an objective of the program was to establish nicotine analogues as an intravenously delivered positive reinforcer?

A. Yes, I think that's correct.

Q. Thank you. The next page at the top says that a research objective was, "To establish if other components of smoke function as intravenously delivered positive reinforcers." Do you believe that that's a correct statement of a research objective of the Nicotine Analogue Program?

A. No.

Q. What's incorrect about it?

A. It has nothing to do with the Nicotine Analogue Program.

Q. Do you know whether any research at Philip Morris determined that acetaldehyde can function as a positive reinforcer?

A. I was not part of that research. I am aware of some of the research that went on and in my opinion there was some data that was produced that suggested that but there was not enough data produced to establish that conclusively.

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Q. And the data that was produced that suggested that acetaldehyde can act as a positive reinforcer, who established that data?

A. Dr DeNoble.

Q. Are you aware of data that contradicts that finding?

A. Dr DeNoble did one set of experiments and if my recollection serves me correctly I can't remember if he had three animals or five animals, but a significant effect was observed in only one of the animals of that group. The others did not show a significant effect. Therefore, based on that it's hard to say if it was a general effect or there was a problem with the experiment.

Q. Are you aware of any research that contradicts Dr DeNoble's findings that acetaldehyde can function as a positive reinforcer?

MR NUNLEY: Asked and answered.

MISS BRACHTL: Asked and not answered, I think.

THE WITNESS: No, I think -- let me say my answer in a different form, then. Doctor--

BY MISS BRACHTL:

Q. Let me just make sure -- I am sorry

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to interrupt you. You can say whatever you want. I'm--

MR NUNLEY: Let him answer, please.

MISS BRACHTL: Let him answer?

MR NUNLEY: Please.

THE WITNESS: Dr DeNoble's own research showed that the effect was not necessarily consistent, which could be that there are several possible interpretations, that it varies from individual to individual or that the observed effect, positive effect, was an artefact or that the observed negative effect was an artefact.

BY MISS BRACHTL:

Q. Okay. Move to strike as non-responsive. Other than as you previously testified, are you aware of any research that shows that acetaldehyde does not function as a positive reinforcer?

MR NUNLEY: I don't know that I can let that stand, Miss Brachtl. If you're going to move to strike the prior answer and then say, "as you previously testified."

MISS BRACHTL: All right. Let me withdraw my motion to strike.

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BY MISS BRACHTL:

Q. Other than as you previously testified are you aware of any research that shows that acetaldehyde does not act as a positive reinforcer?

A. No.

Q. Thank you. Are you aware of research done at Philip Morris that demonstrates that carboxysalsolinol functions as a positive functions as a positive reinforcer?

A. Can you spell that.

Q. Let's look at it, page 23.

A. Yes.

Q. The quotation, well the line that I'm looking at says: "Even though the data is based on only two animals it is important to note that carboxysalsolinol appears to be a very powerful positive reinforcer."

My question to you is whether you are aware of any research at Philip Morris that suggests that carboxysalsolinol is a positive reinforcer?

A. No, I'm not. That's the first time I've ever seen that compound mentioned in my entire life. I don't even know what it is.

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Q. Thank you. No more questions on that document. You have testified about the Nicotine Analogue Program. Was there also a program called the nicotine program?

A. It is the same.

Q. So what we are looking at now is what we have just marked as Sanders exhibit 2. This is a memo from Dr Osdene from three people including you. Have you ever seen this document before?

MR NUNLEY: Can I note for the record, Miss Brachtl, that it's previously been marked as Seeman 7?

MISS BRACHTL: Yes. Okay.

BY MISS BRACHTL:

Q. The question is whether you have ever seen it?

A. I have no real recollection of it but I'm quite sure that I have seen it before.

Q. It says that it's from you. Do you have any reason to believe it's not from you, and others?

A. No, I have no reason to think it's not from me.

Q. And it's titled "Nicotine Program".

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In writing this were you referring to the Nicotine Analogue Program?

A. I'm quite sure of that.

Q. Is it true that one of the goals of the Nicotine Analogue Program was to be able to control the physiological effects of smoke.

MR NUNLEY: I'm sorry. I'm at a little bit of a disadvantage. Are you referring to a specific part of the document?

MISS BRACHTL: Let's not do that. I'm asking questions now without referring to the document.

MR NUNLEY: Okay.

BY MISS BRACHTL:

Q. But since I said is it true -- well, so you can answer the question. Actually, I will rephrase it. Was one of the goals of the Nicotine Analogue Program to be able to control the physiological effects of smoke?

A. As long as we understand that that specifically means eliminating the negative peripheral nervous system effects of nicotine, yes, that is correct.

Q. Okay, we're looking at a document wherein you will say that one of the goals of the

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program is to control the physiological effects of smoke, that doesn't refer to simply eliminating the negative effects on the peripheral nervous system, does it?

A. No, it does not say that in the document.

Q. And is another goal of the Nicotine Analogue Program to measure nicotinic action. I'm looking at the second full sentence. I'm sorry, I'm looking at the first paragraph -- I'm looking at the second paragraph, the first sentence.

MR NUNLEY: Just so the jury will know, we don't have an extra copy of the documents so that I can see what you're talking about.

THE WITNESS: I'm sorry, what are you referring to?

BY MISS BRACHTL:

Q. The second paragraph, the first sentence says: "The predominant considerations in the nicotine program involve the bioassays used to measure nicotinic acid."

A. Action.

Q. Action. Thank you.

A. Yes, I would agree that that is...

Q. Was one of the goals of the Nicotine Analogue Program -- strike that.

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Did you feel that the best way to test the behavioral aspects of nicotine on the central nervous system was to test it in the market place?

MR NUNLEY: Objection. Calls, I believe, for expertise outside this witness's area.

BY MISS BRACHTL:

Q. Okay strike that. Look, if you would, on page 4 at the top of the page. It reads. "CNS Behavioral Aspects. In relation to corporate interests, the ultimate nicotine bioassay is in the market place." Do you see that?

A. Yes.

Q. And this is a memo that you helped write?

A. Yes.

Q. What did you mean by that?

A. "Ultimate" means last; "the last nicotine bioassay is in the market place." In other words, one needs to set up numerous, perhaps, intermediate bioassays but the ultimate one, the one that will finally decide whether successful or failure has been reached is in the market place.

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Q. Thank you. Let's look at the next document which we have marked Sanders exhibit 3?
A. Do you mind if I take a minute to look at that?
Q. No, not at all.
MR NUNLEY: While he's looking at that, counsel, I notice that Sanders 1 was produced in Arch. This means nothing more than it was produced. This is not a confidentiality designation, Mr Shub.
MR SHUB: Right.
MR NUNLEY: Thank you.
THE WITNESS: Okay.
BY MISS BRACHTL:
Q. Were you one of the authors of this memo?
A. Yes.
Q. For the record it's a memo from you, Dr Seeman -- is Carol Levy a doctor?
A. Yes.
Q. And Dr Levy to Dr Osdene. It's dated March 31, 78, titled "Nicotine Program Specific Implementations" Is this referring again to the Nicotine Analogue Program?
A. Yes, it is.

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Q. As part of the Nicotine Analogue Program was the reinforcing property of nicotine studied?

A. I'm sorry, I really didn't understand your question.

Q. Yes, I'm happy to repeat it for you. Were the reinforcing properties of nicotine studied in connection with the Nicotine Analogue Program?

A. Not initially, no. It was an independent program.

Q. What was an independent program?

A. Studying the the reinforcing properties of nicotine was an independent program.

Q. And was that the program that was being conducted by Dr DeNoble?

A. Yes.

Q. Well there is reference here under CNS behavioral Testing that says, "Nicotine discrimination, self-administration and tolerance studies will enable us to examine the cueing and reinforcing properties of nicotine and nicotine analogues in rats."

Is that work that Dr DeNoble was doing?

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A. Yes. That was work that Dr DeNoble did.

Q. And was it your feeling at that time that that work would assist you in the Nicotine Analogue Program?

A. Once he started assuming and once he started doing some work on the analogues the work on nicotine itself would have been no interest to us as far as the Nicotine Analogue Program was concerned.

Q. The work on nicotine was of no interest to you?

A. No.

Q. Why is that?

A. We needed to know how the analogues reacted compared to nicotine.

Q. And you were going to just take as given the way that nicotine acts, is that right?

A. Well, yes, you're correct, that somebody has to determine how nicotine acts but whatever the answer was, it was. It was of no particular interest.

Q. Okay. Was work on the Nicotine Analogue Program done in Germany?

A. Peripheral pharmacological testing was done in Germany.

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Q. Can you tell me just what that was?
A. It was a set of tests using generally either isolated muscles or nerve preparations to look at the peripheral pharmacology of the analogues.
Q. And by peripheral pharmacology of the analogues you're talking about the effect of the analogues on the peripheral nervous system?
A. Yes.
Q. Why was that worked on in Germany?
A. Because they were set up to do it.
Q. You mean physically the lab was set up to do it?
A. Physically the lab was set up to do it and they had the personnel to do it.
Q. Thank you. Look next at Sanders. 4. I'm sorry, before we get into this document let me ask you something about the last document. Was there something different about the lab in Germany that made it important to do the testing there as opposed to in Virginia?
A. No, it was just there. We didn't have to build a new lab.
Q. Did you have the same facilities available in the United States?

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A. No.

Q. What was different about them? Were there laboratory facilities available in Germany that were not available already built in the United States?

A. Yes.

Q. What facilities were those? Could you describe them?

A. No, I can't because I've never worked in a pharmacology lab. We have no pharmacological labs for doing fundamental pharmacology research in the US. I couldn't tell you exactly what the difference in the lab is.

Q. So you don't know what it is that Germany had that America didn't have?

A. No, I rally don't know.

MR NUNLEY: When you say, Miss Brachtl, what Germany had, you mean had the IMBIFO facility that wasn't at R & D in Richmond.

MISS BRACHTL: Yes. Thank you for clarifying that.

BY MISS BRACHTL:

Q. Were the people in Germany that worked on these pharmacology studies, did they have special training that Philip Morris employees

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in the United States did not have?

MR NUNLEY: Objection foundation.

THE WITNESS: Yes. We had a, there was a Ph.D. pharmacologist who essentially directed those tests and we have no such person in the US.

BY MISS BRACHTL:

Q. Right. Let's look at the next document, Sanders 4. Can you identify this as the document that you wrote to Dr Gannon

A. Yes, I can.

Q. The title of the document is "Testing of Nicotine Analogues." Does this memorandum set forth some pharmacological testing that you thought should be done on nicotine analogues?

A. Yes, it does.

Q. Were the tests that you describe here done?

A. Yes, they were.

Q. Were they done in Germany?

A. Yes, they were.

Q. And were the results written up?

A. Yes, they were.

Q. Did the results come to you?

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A. Yes, they did.

Q. Did you send them to the central file?

A. No. What I did with the reports that came to me was as I entered the data on to the sheets that we've already discussed, where we had the list of all the analogues and spaces for entering the types of data, and then I returned the reports to Dr Osdene.

Q. You returned them to Dr Osdene. Did they come from Dr Osdene?

A. Yes. They were sent from Germany to Dr Osdene.

Q. Oh and then Dr Osdene gave them to you?

A. Yes.

Q. You entered the date and gave them back to Dr Osdene?

A. Right.

Q. Was the Nicotine Analogue Program expedited?

MR NUNLEY: Objection as to form.

THE WITNESS: Well, you're using my language here, in order to expedite testing of nicotine analogues.

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BY MISS BRACHTL:

Q. Yes.

A. Yes, I think it was expedited.

Q. Why is that?

A. Because we needed the testing data and the short term tests that we wanted done were done, and I think it provided us the kind of information that was necessary.

Q. And is the reason you needed those test results because Philip Morris was anxious, if at all possible, to obviate some of the adverse affects on the peripheral nervous system of nicotine?

MR NUNLEY: Objection. Foundation.

THE WITNESS: Not at all. I was anxious to get the work moving.

BY MISS BRACHTL:

Q. Why?

A. There is an -- we were, as you can see by this list that's appended, we had synthesized a great many compounds. Our objective was to learn something about the peripheral nervous system effects of these compounds and we had no testing. It didn't make sense to keep two or three chemists busy making compounds when we had no data as to

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what the compounds were doing. I was a little irritated at the time.

Q. Dr Leo Abood did some work on the Nicotine Analogue Program, right?

A. Yes, he did.

Q. And he was the CTR grantee, right?

A. I don't know.

Q. Had Dr Abood done work for Philip Morris before his work on the Nicotine Analogue Program?

A. I don't know.

Q. Did you work with him?

A. Yes.

Q. What work did he do?

A. Dr Abood tried to set up bioassays that could be used to compare different compounds in terms of their central nervous system effect.

Q. For the record, what are bioassays?

A. Bioassays are any type of test that can be done, rather than using a whole organism can be done either on isolated tissue or isolated cells that essentially allow you to do tests very rapidly to get results.

Q. Geographically where did Dr Abood do that work?

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A. The University of Rochester.
Q. And how long did he work on that?
A. Maybe three years. I don't remember exactly.
Q. Look, if you -- did he report to you?
A. He didn't report to me. I mean he was, actually he reported to Tom Osdene. I mean, the consulting relationship was really with Dr Osdene, but of course he communicated with me.
Q. Okay. He kept you apprised of his work?
A. Yes.
Q. Look at this document, would you. I just want you to identify it as a copy recipient.
MR NUNLEY: Which one are we on now?
MISS BRACHTL: Thank you. Sanders 5, I guess this is. It is the March 21, 1980, from Dr Seeman to Dr Seligman and cc'd to doctors Osdene and Sanders. Turn to the next page you see your name there as a "cc" recipient?
MR NUNLEY: Let the witness look at the document, please. (Pause)

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BY MISS BRACHTL:

Q. Do you recognize that document?

A. Quite frankly, no.

Q. All right. Then I guess you have no idea what was redacted from the second page?

A. Absolutely not.

Q. Thank you. Now look at Sanders 6, please?

A. That's the same one.

Q. And I just want you to tell me whether this is a--

MR NUNLEY: We have a problem, Miss Brachtl. It appears as though a copy of Bates Number 1003289972 through 973 has been marked as Sanders 5 and a second copy as Sanders 6.

(Pause to reorganize documents)

BY MISS BRACHTL:

Q. While we are waiting I am concerned about the time. Let's move on to Sanders 7 and come back to Sanders 6. I would like you, sir, simply to identify this document for me. It's from Seeman, Levy and Sanders to Osdene. It's dated February 3, 78. I just would like to know whether you wrote this?

A. No. I see what the problem is. I have that

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document listed as Sanders 8.

Q. You have it as Sanders 8?

A. Yes. And Sanders 7 is undoubtedly what you have as Sanders 6.

Q. Well, let's just stick with Sanders 8. If these are out of order, they're out of order. You've got Sanders 8 and that's the memo from Seeman, Levy and Sanders to Osdene. I just want you to identify that for me?

A. That's February 3, 1978.

Q. That's right.

MR NUNLEY: When you say identify, what do you mean?

BY MISS BRACHTL:

Q. Do you recognize it?

A. Give me a minute to look at it.

Q. Please. Then my next question is going to be is that something you participated in the writing of?

MR NUNLEY: In the interests of time I would suggest that at the end of the deposition we go through and correlate exhibit number to Bates stamp number.

MISS BRACHTL: Okay.

THE WITNESS: Okay.

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BY MISS BRACHTL:

Q. So, do you recognize this memo?

A. Yes, I do.

Q. Is it something that you wrote?

A. It's something that I wrote at least part of, yes.

Q. I just want to confirm, at the top of page 3, the third sentence in the first paragraph is: "This allows us to answer the question, 'Does compound X produce a cue similar to that produced by nicotine?' We also need to examine the reinforcing properties of nicotine which will allow us to answer the question, 'Is compound X reinforcing?'."

Is it true that answering that question is something that was part of the Nicotine Analogue Program.

MR NUNLEY: Two questions in the question. Which question were you referring to?

MISS BRACHTL: Both.

MR NUNLEY: Well then the objection is compound.

THE WITNESS: All right. I'm sorry. You don't need to read that quote again but could you ask your question again?

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BY MISS BRACHTL:

Q. Sure. Is one of the questions that the Nicotine Analogue Program wanted to answer, "is compound X", meaning something that was going to be synthesized for use as a nicotine analogue, "reinforcing"?

A. Let's start from the top of the paragraph, if we may. "Attempts to develop in-house bioassays". What this says is, in answering you, that we were looking into the possibility of using the reinforcing properties with the reinforcing paradigm of a rat as a possible bioassay for nicotine central nervous system activity.

Does that answer your question?

Q. I'm not sure I heard it so either the court reporter can read it back or you can tell me again.

A. All right. It says, "Attempts to develop in-house bioassays" our interests in both discrimination as reinforcing was to the appropriateness of these as bioassay tools as part of the Nicotine Analogue Program. And I think that's the point that I'm trying to get across. The objection was not to develop something that was reinforcing. The objective was, "Is this a

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useful bioassay that we can use?"

Q. So is it your testimony that in doing the Nicotine Analogue Program you didn't care if the analogues were reinforcing.

MR NUNLEY: Objection--

THE WITNESS: Not necessarily.

MR NUNLEY: --mischaracterizes his prior testimony.

THE WITNESS: Not necessarily.

BY MISS BRACHTL:

Q. Did you believe, in the mid-70s that you could identify smokers who were dependent on nicotine by their smoking behavior?

MR NUNLEY: Objection. Calls for testimony outside this witness's expertise.

THE WITNESS: I couldn't answer that question.

MISS BRACHTL: He's not an expert. I'm not examining him as an expert, counsel, so I don't know how I could be asking for something outside his expertise.

MR NUNLEY: My objection was based on the fact that I think that calls for an expert opinion. Whether you qualify him as an expert or not, if you ask a question that asks for an expert

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opinion, it's objectionable.
BY MISS BRACHTL:
Q. Was it your personal opinion in the mid-70s that a smoker who is dependent on nicotine could be identified by his or her smoking behavior?
A. I never thought of the situation that way. I really couldn't answer that question.
Q. Let's look, then, at the next document, February 26, 1976 from you and Dr Seeman to Frank Ryan, and that is marked Sanders -- what is it? Counsel what's the number on that?
MR NUNLEY: It's number 9.
MISS BRACHTL: Thank you.
THE WITNESS: This is now number 9. Excuse me.
BY MISS BRACHTL:
Q. First of all, do you recognize it as the memo that you wrote together with Dr Seeman?
A. (Pause) Okay, I recognize this memo.
Q. Does that refresh your recollection as to whether at the time this memo was written you believed that you could identify nicotine dependence by examining the smoking habits of

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smokers?

MR NUNLEY: Are you referencing a specific part of the memo because I don't have it?

MISS BRACHTL: I'm sorry. I'm looking at the first full paragraph on the second page. Specifically I'm looking at the line that says, "These cigarettes would be smoked by subjects whose smoking habits had been shown to indicate nicotine dependence."

MR NUNLEY: And I am sorry, the question is what?

BY MISS BRACHTL:

Q. Whether this refreshes your recollection that in the mid-70s you thought that smokers who were nicotine dependent could be identified by their smoking habits?

A. And I'm sorry, I just don't remember and I'm sure -- I mean, I don't question that that's my memo at all, and I don't remember exactly why I said that sentence or what I was trying to get at in that sentence.

Q. Okay. Let's just finish up by going back to what we have now discovered, apparently I misspoke; look please what at we have marked as Sanders exhibit 7.

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A. Yes.

Q. Just identify it for me if you would, please. Is that a document that you have seen before?

A. Yes.

Q. And is it a document that you wrote?

A. Yes.

Q. Thank you. Let's break for lunch.

MR NUNLEY: Before we go off the record, we were scheduled to start at ten, we started about 1030. Normally in a deposition we would take an hour or so for lunch. We do have some time constraints. We're happy to cut lunch as short as you like to cut it.

MISS BRACHTL: Thank you. I certainly appreciate that. I don't think I can eat faster than thirty minutes.

Off the record at 2.14 p.m.

On the record at 3.15 p.m.

EXAMINATION:

BY MISS BRACHTL: (Continued)

Q. Dr Sanders, do you know whether any cigarettes sold by Philip Morris at any time contained in their smoke polycyclic hydrocarbons?

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A. I think I can say that yes, cigarettes sold by Philip Morris do contain in their smoke polycyclic aromatic hydrocarbons.

Q. Are polycyclic aromatic hydrocarbons the same as polycyclic hydrocarbons?

A. No, but that's all right.

Q. I'm going to use two terms. I'm going to tell you how I mean them and you tell me if you agree with my definitions. I'm going use the term carcinogenic to mean cancer producing. Do you agree with that?

A. Yes, I do.

Q. I'm going to use the term tumorigenic to mean tumour producing. Do you agree with that?

A. Yes, I do.

MR NUNLEY: One point of clarification both for carcinogenic and tumorigenic, do you mean in animals in humans, in both? What do you mean?

MISS BRACHTL: I'm not differentiating.

BY MISS BRACHTL:

Q. Polycyclic aromatic hydrocarbons are tumor producing in animals, are they not?

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A. They have been established and shown repeatedly through animal testing to be tumorigenic in animals.

Q. There is alleged to be a major link between polycyclic aromatic hydrocarbons and disease in humans, correct?

MR NUNLEY: Objection as to form.

MISS BRACHTL: What's your objection, counsel?

MR NUNLEY: "A major link" is that right?

MISS BRACHTL: Yes.

MR NUNLEY: I don't know what that means.

BY MISS BRACHTL:

Q. Okay. Let me rephrase the question. There is alleged to be a link between polycyclic aromatic hydrocarbons and disease in humans. Correct?

A. Based on animal testing there are, certainly some people believe that polycyclic aromatic hydrocarbons could be tumorigenic in humans.

Q. Did Philip Morris do any research that you're aware of to determine whether or not

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polycyclic aromatic hydrocarbons are disease producing in humans?

A. Not to my knowledge.

Q. Did Philip Morris ever do any research that you're aware of to determine whether or not polycyclic aromatic hydrocarbons are carcinogenic in humans?

A. Not to my knowledge.

Q. Did Philip Morris ever do any research that you're aware of to determine whether or not polycyclic aromatic hydrocarbons are tumorigenic in humans?

A. Not to my knowledge.

Q. Did Philip Morris ever do, as far as you are aware, any literature reviews to determine whether there was any literature on whether polycyclic aromatic hydrocarbons are disease producing in humans?

MR NUNLEY: Objection as to form. Excuse me, objection as to foundation.

THE WITNESS: I'm not sure I can answer totally factually but I would say, yes, it would be my understanding that Philip Morris has done such literature research.

BY MISS BRACHTL:

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Q. Tell me to the best of your understanding what literature research Philip Morris has done to determine whether or not polycyclic aromatic hydrocarbons are disease producing in humans?

A. I couldn't really fully answer that question. I know we have people, and we have had in various departments, whose responsibility is to survey the literature and to be aware of what literature could be relevant to our products. So that's why I say I'm quite sure that such literature has been surveyed, but I'm quite sure that I have never seen the results of that nor could I tell you the details of that because I'm not in that area.

Q. Am I correct in understanding that the basis for your answer that Philip Morris has done literature review to determine whether or not polycyclic aromatic hydrocarbons cause disease in humans, is based on your understanding that generally Philip Morris does research into matters relevant to its products?

A. Literature reviews is what I said.

Q. Thank you.

A. Yes.

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Q. So other than that, do you have any actual knowledge about whether or not Philip Morris ever did any such literature reviews about polycyclic aromatic hydrocarbons?

A. I can't think of anything off hand that would allow me to answer that specifically, but...

Q. Thank you. When did you first become aware that the tobacco smoke generated by cigarettes sold by Philip Morris contained polycyclic aromatic hydrocarbons?

A. I don't remember exactly, but probably in the middle 1970s.

Q. Are you aware of any steps that were taken by Philip Morris to reduce the level of polycyclic aromatic hydrocarbons in its cigarette products?

A. I'm aware of considerable research that has gone on from time to time to look to attempt to find methods to reduce these polycyclic aromatic hydrocarbons in cigarette smoke.

Q. Were any of those efforts successful?

A. No, none of those methods were successful except for, of course, reducing the total amount of smoke through filtration which at the same time

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reduces these compounds in cigarette smoke.

Q. By "these compounds" you're referring to polycyclic aromatic hydrocarbons?

A. Yes, I am.

Q. It's true, is it not, that different kinds of tobacco generate different amounts of polycyclic aromatic hydrocarbons?

A. I am certainly not aware of that and would be very surprised if that were true.

Q. The tobacco smoke generated by cigarettes sold by Philip Morris has contained nitrosamines -- correct?

A. That is correct.

Q. When did you first become aware that tobacco smoke from cigarettes sold by Philip Morris contained nitrosamines?

A. Again I don't remember exactly, but probably around the middle 70s.

Q. Nitrosamines are tumorigenic, right?

MR NUNLEY: Objection as to form. In what species?

BY MISS BRACHTL:

Q. You can answer my question?

A. Most nitrosamines are tumorigenic in

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animals. There is no data that could be used to state right now that they would be tumorigenic in humans.

Q. When you say most nitrosamines are tumorigenic in animals, are the nitrosamines that are tumorigenic in animals contained in the smoke of cigarette products sold by Philip Morris?

A. Some of the nitrosamines contained in the cigarettes sold by Philip Morris have been shown to be tumorigenic in animals.

Q. Did Philip Morris ever do any research of which you are aware to determine whether or not nitrosamines are tumorigenic in humans?

A. Not to my knowledge.

Q. Are nitrosamines--

A. Excuse me. Sometimes I get myself in a mode of 1973 to 1979. May I answer that question more fully?

Q. Thank you.

A. Currently there is a project that was started approximately three or four months ago that is directed exactly toward that goal, to determine if at least one of the nitrosamines that is formed in cigarette smoke of products sold by

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Philip Morris that has been shown to be tumorigenic in animals is also tumorigenic in humans.

Q. Prior to this past year, were you privy to any discussions that may be have taken place at Philip Morris about the possibility of doing research to determine whether or not nitrosamines are tumorigenic in humans?

A. Yes.

Q. Tell me about those discussions, please?

A. Those discussions were based on very preliminary evidence and literature which would suggest that one such nitrosamine, specifically the one abbreviated NNK, is metabolized differently in human tissues than it would be metabolized in mouse tissues.

Q. When was that discussion?

A. The first discussion I'm aware of would have taken place a little over a year ago, a year and a half ago.

Q. NNK is carcinogenic, is it not?

MR NUNLEY: Objection. In which species?

BY MISS BRACHTL:

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Q. You can answer.
A. NNK has been show to be carcinogenic in three different animal models, the mouse, the hamster and the rat.
Q. Other than as you have already testified -- strike that. Are you aware of any research done, other than research that may have been undertaken within the past year, to determine whether or not NNK is carcinogenic in humans?
A. As I indicated before, there are a few publications recent, two or three years old at most, which have started to explore that issue.
Q. Can you tell me why -- strike that. It has been reported for sometime that nitrosamine is tumorigenic in animals, right?
A. Yes.
Q. Can you tell me why Philip Morris didn't do research before this past year to investigate whether nitrosamine is tumorigenic in humans?
MR NUNLEY: Objection. Foundation and speculation.
BY MISS BRACHTL:
Q. You can answer?
A. Up until recently we had never had someone

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on our staff who was an expert in that area. Approximately a year and a half ago we hired somebody who fit that requirement. None of the rest of us would have felt comfortable either suggesting or trying to carry out such research.

Q. When you first, when you personally first heard that nitrosamines are tumorigenic in animals did it not occur to you that it would be a good idea to investigate whether or not nitrosamine is tumorigenic in humans?

MR NUNLEY: Objection as to form.

THE WITNESS: I'm thinking a minute on this one. (Pause) I am, again, as I said, not an expert in this field. When I heard that nitrosamines were tumorigenic in animals I did not, at that time certainly, know enough about the possibility of biological mechanisms, how to do that work. My assumption probably would have been that if it were tumorigenic in animals it was very likely to have also been tumorigenic in humans.

Q. Thank you. Let's step back to polycyclic aromatic hydrocarbons and let me ask you whether you were ever privy to any discussion about the possibility of Philip Morris doing research into whether polycyclic hydrocarbons were

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injurious to humans?
A. No, not that I can think of.
Q. Did it ever occur to you personally, when you heard that polycyclic hydrocarbons were tumorigenic in animals, that it might be a good idea for Philip Morris to do research into whether or not they were tumorigenic in humans?
MR NUNLEY: Objection as to form.
THE WITNESS: No, because again I would have thought there was a good possibility that they were and therefore a much better strategy was to see if techniques could be developed to reduce or eliminate them from smoke.
BY MISS BRACHTL:
Q. Was Philip Morris ever successful in reducing the level of nitrosamines in smoke?
A. Through laboratory experiments?
Q. Any way?
A. There were experiments carried out that did show that one could effect some reduction of nitrosamines in smoke.
Q. Who carried out those experiments?
A. They were carried out by a project within the Biochemical Research Division.

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Q. Is there a name for that person?
A. There is a name but I don't remember the name.
Q. Okay, were you involved in it?
A. For the period during which I was Manager of Biochemical Research, yes, I was involved in it.
Q. I've not been complete in my prior questions. I've asked you about whether or not Philip Morris did research into whether polycyclic hydrocarbons caused disease in humans. I did not ask whether Philip Morris contracted with anyone else to do that kind of research and I'm going to ask you that now?
A. Not to my knowledge.
Q. Okay. And did Philip Morris contract with anyone outside of the company to research into whether nitrosamines are injurious to human health?
A. Except for what I've already outlined, not to my knowledge.
Q. Thank you. It's true, is it not, that different kinds of tobacco produce different amounts of nitrosamines when burned?
A. Our research certainly indicates that that

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is the case.

Q. Did Philip Morris make any attempts to -- strike that. When did Philip Morris's research indicate that?

A. Probably starting in about 1980 or so.

Q. And after 1980 was any attempt made, to the best of your knowledge, to use in its commercial products the types of tobacco that produced less amounts of nitrosamines.

MR NUNLEY: Objection. Foundation.

THE WITNESS: Not to my knowledge.

BY MISS BRACHTL:

Q. Do you know whether Philip Morris in any way told smokers that its cigarettes contained -- strike that. Do you know whether Philip Morris in any way told smokers that the smoke from its cigarettes contained nitrosamines?

A. Not to my knowledge.

Q. Did you ever hear any discussion of that subject?

A. Not that I can think of, no.

Q. Did Philip Morris disclose to smokers in any way that smoke from its products contained polycyclic hydrocarbons?

A. To the extent that a number of publications

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were generated by Philip Morris dealing with that subject and developing analytical methodology in presenting data of the levels of polycyclic aromatic hydrocarbons in smoke, yes.

Q. The publications that you're referring to, tell me what they are?

A. They would be scientific publications which would have appeared in scientific journals.

Q. Okay, other than publications that appeared in scientific journals or information that appeared in scientific journals, did Philip Morris do anything to inform consumers that smoke from its products contained polycyclic hydrocarbons?

MR NUNLEY: Objection. Foundation. This is not a 30.b.6 witness.

THE WITNESS: Not to my knowledge.

BY MISS BRACHTL:

Q. Do you know who T. Yu, Y-U, is?

A. No.

Q. Dr Yu?

A. Oh, I'm sorry. Dr Terry Yu, yes.

Q. Thank you. And is Dr Terry Yu someone that worked for you at some point?

A. Yes.

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Q. And how about was there a Dr Warfield that worked for you?

A. Yes, there was a Dr Warfield.

Q. Let me show you a document. Take a look at it. Tell me whether you have seen it before. (Handed) It is marked Exhibit 10. It is a memo dated September 13, 1984, to you from doctors Yu and Warfield. Take your time. (Pause) Feel free to look at that as long as you want. What I'm going to ask you is whether you received it and I'm going to ask you a couple of questions about interpreting that chart there.

MR NUNLEY: When you say "that chart" you mean the one the first page of the exhibit?

MISS BRACHTL: The first page continuing to the second.

THE WITNESS: Okay.

BY MISS BRACHTL:

Q. I asked you before whether or not nitrosamines were tumorigenic in animals and I believe your answer was yes whatever it was it was. Did you ever hear that nitrosamines were carcinogenic to animals?

MR NUNLEY: Objection as to form.

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THE WITNESS: There was certainly data and literature which would strongly suggest that nitrosamines are carcinogenic to animals.

BY MISS BRACHTL:

Q. Thank you. Do you know whether Philip Morris ever did any research or studies of any sort to determine the level at which nitrosamines are tumorigenic in animals?

A. No. To my knowledge Philip Morris never did any such research.

Q. Do you know whether Philip Morris contracted with anyone else to perform such research for it?

A. To my knowledge, no.

Q. Do you know whether the Council for Tobacco Research sponsored any such research?

A. I would not know.

Q. Do you know whether Philip Morris either did on its own or contracted with anyone to do research to determine the levels at which polycyclic aromatic hydrocarbons are tumorigenic to animals?

A. Not to my knowledge.

Q. Do you know whether or not the Council for Tobacco Research sponsored any such

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research?
A. I would have no idea.
Q. Thank you. Do you recognize this exhibit 10?
A. I quite frankly don't remember this specific memo, no.
Q. In that it's addressed to you, do you have any reason to think it wasn't sent to you?
A. I know very well it was sent to me. It is a rough draft and those are my comments in the margin.
Q. Ah, that's your handwriting, then?
A. That's my handwriting.
Q. Thank you. It appears to me that this chart seems to indicate for different kinds of tobacco the activity level of polycyclic aromatic hydrocarbons. Is that correct?
A. Yes, that would suggest to be correct.
Q. It also seems to me to indicate for different types of tobacco the activity level of tobacco-specific nitrosamines. Is that right?
A. That is correct.
MR NUNLEY: Are you saying the activity level?

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MISS BRACHTL: I am.

THE WITNESS: I'm sorry. You said the activity level, and I -- the level, not the activity level. The level.

BY MISS BRACHTL:

Q. Thank you. So the record is clear then, is it your testimony that this chart reflects the level of polycyclic aromatic hydrocarbons in different types of tobacco -- right?

A. Yes.

Q. And it also indicates the level of tobacco-specific nitrosamines in tobacco -- right?

A. Yes.

Q. As well as some other things -- right? Right?

A. Yes.

Q. So am I correct that this chart shows, for example, that Oriental tobacco has more polycyclic aromatic hydrocarbons than does Burley?

A. Excuse me. I'm sorry to take some time but as I'm looking at this table, let me -- because it's been a while; this was in 1984 which is 13 years ago and I would like to be sure that I do thoroughly understand the memo to answer your

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question correctly.

Q. Please take your time?

A. (Pause) Okay. Now if I may volunteer some information.

Q. I'm listening?

A. Apparently as precise as scientists are sometimes they're not precise enough. You used the words "activity level" which is drawn directly from the memo. For columns one and two, for instance, Salmonella mutagenicity assay and L5178Y assay the term "activity level" is correct because that is measuring some type of activity. For the rest of the columns in there my best interpretation of this is that even though it says "level of activity" it refers to the level, the concentration level.

Q. Thank you.

A. And the author was not sufficiently precise.

Q. Thank you. I appreciate that?

A. And neither was I in correcting him.

Q. So am I correct that this chart shows, for example, that there is a higher level of polycyclic aromatic hydrocarbon in Oriental tobacco than in Burley tobacco?

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A. It would seem to show that, yes.

Q. So am I correct that to reduce the amount of polycyclic aromatic hydrocarbons in its products Philip Morris could have used more Burley and less Oriental. Is that right?

MR NUNLEY: Objection. Improper hypothetical.

MR SHUB: What is your objection?

MR NUNLEY: It's an improper hypothetical.

BY MISS BRACHTL:

Q. You can answer, sir.

A. I, quite frankly, find that particular entry a little bit difficult to believe though it may indeed reflect indeed the data that was there. So assuming that we have to take this table at face value that table would suggest that if we used less Oriental and less Bright we would decrease the amount of polycyclic aromatic hydrocarbons in cigarette smoke.

Q. Thank you. And you're not aware of Philip Morris doing that, are you?

A. No, I'm not.

Q. Am I correct also in thinking that this chart shows, if we're assuming that this

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chart is correct that there are more -- strike that. Am I correct also that this chart indicates that there is more tobacco-specific nitrosamine in Burley tobacco than in Bright?

A. That is correct.

Q. So if we rely on this chart it's correct, is it not, that Philip Morris could have reduced the tobacco-specific nitrosamines in its products by using more Burley and less Bright?

MR NUNLEY: Objection. Improper--

MISS BRACHTL: I'm sorry. Counsel.

MR SHUB: It's not a hypothetical.

MR NUNLEY: Excuse me. Objection, improper hypothetical.

BY MISS BRACHTL:

Q. You can answer.

MR NUNLEY: I beg to differ, Mr Shub.

THE WITNESS: Unfortunately -- I'm sorry I don't mean to say that. Would you please rephrase what you said because I think what you said was in error?

BY MISS BRACHTL:

Q. Okay, I sure will. Going from this chart Philip Morris could have reduced the

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tobacco-specific nitrosamines in its commercial products by using more Bright and less Burley tobacco.

MR NUNLEY: Same objection.

THE WITNESS: That is correct.

BY MISS BRACHTL:

Q. Thank you. I think you're right. I misspoke before and I thank you for correcting that.

A. However, may I say something? As--

MR NUNLEY: Don't volunteer. Just answer her questions.

BY MISS BRACHTL:

Q. One way to do away with -- I'm done with the document. I have been using the term tobacco-specific nitrosamines. What does that mean?

A. That means nitrosamines that are formed only in tobacco or through the combustion of tobacco.

Q. And those nitrosamines, are they some of the same nitrosamines that were shown to produce tumors in rodents?

A. Some of them, yes.

Q. Thank you. Tobacco-specific

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nitrosamines are formed during the burning of the tobacco, is that right?

A. Our research would tend to suggest that some of the tobacco-specific nitrosamines are formed during the burning of tobacco. That is correct.

Q. One way to remove tobacco-specific nitrosamines -- strike that. One way to prevent tobacco-specific nitrosamines from being formed would be to remove the alkaloids from the tobacco. Isn't that right?

MR NUNLEY: Objection. Vague.

THE WITNESS: Our research would suggest that removal of two minor alkaloids from tobacco, nornicotine and anatabine, would reduce the levels of NNN and NAT.

BY MISS BRACHTL:

Q. And if you reduce the levels of NNN and NAT do you prevent the formation of TSNA?

A. No. That would still leave--

Q. NNK?

A. NNK.

Q. But it would significantly reduce the formation of TSNA, is that right?

A. It would tend to reduce the formation of

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TNSA.

Q. Significantly?

A. Dependent on the type of tobacco it could be significantly, yes.

Q. As far as you know did Philip Morris, in order to cut down on TNSA in its cigarettes, remove alkaloids?

A. Some research was done in that area, yes.

Q. Were commercial products made from which alkaloids had been removed?

A. No.

Q. Do you know?

A. Any process that anyone was able to find that could have done that would not have really been commercializable because one was going through a rather harsh treatment of the tobacco and what would have been left would have been almost impossible to manufacture into cigarettes.

Q. Did Philip Morris, so far as you know, test market cigarettes without alkaloids?

A. Philip Morris test marketed a cigarette that was greatly reduced in nicotine.

Q. What cigarette was that?

A. It was Denic or Next.

Q. Okay another name for Next is

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Denic?

A. Yes.

Q. Can you tell me the extent of the test marketing that was done for the Next cigarette?

MR NUNLEY: Objection. Foundation.

THE WITNESS: I'm not sure I really remember well. I seem to remember there were three different test markets and I no longer remember what cities they were in, and the test market lasted from 6 to 9 months, something like that.

BY MISS BRACHTL:

Q. Another way to avoid forming TSNA would be to remove nitrates from the tobacco. Is that right?

A. That is not necessarily correct.

Q. What do you mean "not necessarily"? Is it sometimes correct?

A. No. We don't have enough info -- I don't have enough technical information, nor does anyone else, to answer that question.

Q. Is it not necessary to have nitrates present to form TSNA?

A. Nitrates themselves are not at all a precursor to TSNA.

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Q. Have you ever heard of the super-critical extraction process?
A. Yes, I have.
Q. What is that?
A. It was a process developed using a supercritical carbon dioxide to extract nicotine from tobacco.
Q. Does it remove any alkaloids other than nicotine?
A. I can't say any alkaloid. However, it does not effectively remove either nornicotine or anatabine.
Q. Would you prevent TSNA from being produced if you removed nitrogen?
MR NUNLEY: Objection as to form.
THE WITNESS: You mean nitrogen gas or every nitrogen containing compound in tobacco?
BY MISS BRACHTL:
Q. Oxides of nitrogen?
A. No.
Q. No. Let me show you another document. We'll mark it exhibit 11. I'm going to ask you whether you've seen it. Do you recall seeing this before?
A. Excuse me. Just give me one moment.

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Q. Please take as long as you like. I certainly don't mean to rush you.

MR NUNLEY: So that I understand, some of the documents we've seen have said "Arch", produced in the Arch case. This document doesn't. Was it produced in Frosina?

MR SHUB: No. I do not believe it was produced in Frosina. It was produced from the Minnesota Depository.

MISS BRACHTL: I don't think that's true. Is there a problem with it, counsel?

MR NUNLEY: No. I'm just surprised it doesn't have a production origin spot legend on it.

MR SHUB: Some documents that have been produced out of the Minnesota Depository do not have production legend. You know it's Minnesota Depository by the Bates stamp numbers.

MR NUNLEY: Why do you say that?

MR SHUB: Well, you know, let met step back. I'm not making a representation. It's my experience in this litigation that is a Minnesota production number. I can't be assured, however, that it is.

MISS BRACHTL: Counsel, if you have

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a problem with the document we can just call it confidential till you figure out otherwise.

MR NUNLEY: I'd just like to know how it came into your possession, that's all.

MR SHUB: We don't just receive documents in this litigation directly from Philip Morris. We've received documents through other channels and used them in this case even though they're not marked up.

MR NUNLEY: And this would be one of those documents?

MR SHUB: Right.

MR NUNLEY: Okay.

BY MISS BRACHTL:

Q. You've had an opportunity to look at the document.

MR NUNLEY: I would just, for the record, like to identify this document as bearing Bates number 2024843545 through--

MISS BRACHTL: Actually not "through" because the pages are not in order. If you'd like, when we go off the record at the end, we can put every page on but I notice the Bates numbers aren't in any order.

MR NUNLEY: Do you know if that's

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because that's how it was produced?

MISS BRACHTL: I don't know.

MR SHUB: I have no idea. I don't know why. This is how we have received this document.

MR NUNLEY: I mean normally if you'd received it from me and it was in this order then I would say, if I produced it to you then I'm kind of stuck with it. But having been told that it didn't come through one of my productions I'm just a little bit worried. Maybe we ought to just say for the record that it's a document that looks to be 20 pages long and they seem to be completely out of order. So to the extent order has any bearing on whether the document makes sense or not to the witness or the jury or anyone else, I think I'd have to object until I was able to determine whether or not it was in the right order.

BY MISS BRACHTL:

Q. Dr Sanders you've had a chance to take a glance at this?

A. Yes.

Q. Do you think you've ever seen it before?

A. I don't have any recollection of seeing

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this particular document but I'm certainly aware of everything in the document.

Q. Look at -- it's going to be hard to do because the pages aren't in order. Was it at some point an objective at Philip Morris to reduce tobacco-specific nitrosamines in mainstream smoke by 50 percent?

A. Yes, it was.

Q. And was it an objective to, long term, completely eliminate tobacco-specific nitrosamines in mainstream smoke?

A. Yes, it was.

Q. Turn to the next page please. Just the next page. 2024843571, and at the top it says, "TSNA are an important smoking and health issue." Do you agree with that?

A. Yes, I do.

Q. There is also indication at the bottom that, "TSNA content of mainstream smoke can be reduced by blend modification."

That's true, is it not?

A. Yes, it is true.

Q. And that there is also indication that TSNA content of mainstream smoke can be reduced by antioxidants. Is that true?

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A. Yes, that is true.

Q. And this document also indicates that TSNA content of mainstream smoke can be reduced by supercritical fluid extraction of filler. Is that true?

A. That's true.

Q. Thank you. Look at, turn about three pages and if you look at 2024983560 (sic) the page that starts at the top by saying "PM research results," there's an indication--

MR NUNLEY: I'm sorry, 202498?

MISS BRACHTL: 2024843560. It's the page that starts off--

MR NUNLEY: Okay, I've got it.

BY MISS BRACHTL:

Q. This indicates that if you remove nitrate, TSNA is not formed. Is that correct?

MR NUNLEY: Is the question whether or not this document indicates that or whether or not, standing apart from the document, that's a true statement?

MISS BRACHTL: Yes. That's correct. Thank you counsel.

BY MISS BRACHTL:

Q. Forget about the document. Can you

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prevent formation of TSNA by removing nitrate?
A. I don't know the answer to that.
Q. Do you know of any research that was done into that?
A. Yes, I know a lot of research that was done into that. No one has been able to answer that question.
Q. Is one way to remove -- strike that. What is nitrate reductase, do you know?
A. Yes.
Q. What is it?
A. It's a plant enzyme that would reduce nitrate to nitrite.
Q. Thank you. Turn some pages till you come to the one that says."Plans: Genetic Engineering." This page refers to a Calgene contract. Do you know anything about that?
A. Yes, I do.
Q. Tell us what you know, please?
A. It was researched that we contracted with Calgene, a small California biotech firm to develop what is called anti-sense technology, that is to develop--
Q. I'm sorry, I didn't hear you?
A. Anti-sense technical which means developing

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a codon that would be anti-sensed to the codon that's responsible for some step along alkaloid biosynthesis that would block that step.

Q. Codon. What is a codon?

A. A codon is that part of a gene which essentially codes for an amino-acid or a protein.

Q. And is that research -- I'm sorry, was at that contract connected with attempts to reduce nitrosamines in the cigarette smoke?

A. It was one possible approach to reducing nitrosamines in cigarette smoke, yes.

Q. And did Philip Morris enter into a contract with Calgene to do that work?

A. Yes, they did.

Q. What was Calgene's results, if any?

A. Calgene never got past the first step. If you look at that -- oh, I'm sorry.

Q. Go ahead.

A. No, sorry.

Q. Keep turning some pages until you come to the one that says "Blend Component Modification"?

A. Okay.

Q. At the bottom this document appears to me to talk about using different percentages of

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tobacco and it concludes as a result mainstream TSNA reduced by 33 percent. I know you didn't write this document but do you have an understanding of what that means?

A. Yes, I do.

Q. Could you explain it, please?

A. Which part of it?

Q. Well, is this showing the process by which tobacco-specific nitrosamine could be reduced by about a third?

A. This shows a blend.

Q. Okay.

A. In other words, a blend was constructed of, as shown here, 20 percent Virginia sun cured, 40 percent low alkaloid Bright, 20 percent low alkaloid Burley and 20 percent Oriental and mainstream TSNA, as you see, was reduced by 33 percent.

Q. Do you know when this blend was arrived at?

A. I don't know exactly.

Q. Do you have any idea?

A. Probably around 1984 or 1985.

MR NUNLEY: Just for the record

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BY MISS BRACHTL:

Q. Thank you. Let's just finally turn to the next page which is 2024843569, a page titled "Addition of Antioxidants to Filler", and it says, result, mainstream TSNA reduced by 20 to 40 percent. Is this page describing ways that tobacco -- strike that. What is this page describing?

MR NUNLEY: What do you mean? How does he interpret the page?

MISS BRACHTL: Thank you.

THE WITNESS: This page shows two experimental pieces of date, one Burley with added ascorbyl palmitate and the other Burley plus PrDHHC which says it's a caffeic acid derivative and I no longer remember exactly what it is. This shows that these cigarettes not giving the specific amounts, which are rather large, showing that through that one can reduce nitrosamines by, it says, 20 to 40 percent.

BY MISS BRACHTL:

Q. So, it's correct, isn't it, that Philip Morris knew several ways to reduce TSNA, certainly by the mid 80s?

MR NUNLEY: Objection. Are you

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asking commercial basis, research basis?

MISS BRACHTL: Research basis.

THE WITNESS: On a research basis Philip Morris had several possible approaches that had been shown in the research laboratory to reduce TSNAs.

BY MISS BRACHTL:

Q. When is the earliest that Philip Morris knew, on a research level anyway, of options available to it to reduce tobacco-specific nitrosamines?

A. I would guess 1984.

Q. Was there some work done in Philip Morris's European laboratories before 1984 on reduction of TSNA?

A. No.

Q. The tobacco contained in cigarettes sold by Philip Morris contains phenols, right?

A. Yes, it does.

Q. What is a promoter?

MR NUNLEY: Objection. Standing alone I think that's vague.

BY MISS BRACHTL:

Q. Have you ever heard that phenol is a promoter?

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MR NUNLEY: Same objection.

BY MISS BRACHTL:

Q. Have you ever heard that phenol is a promoter?

MR NUNLEY: Same objection.

THE WITNESS: I don't really know that phenol itself is a promoter.

BY MISS BRACHTL:

Q. Does phenol enhance the activity of polycyclic hydrocarbons?

A. I honestly don't know.

Q. Have you ever that phenol enhances the activity of polycyclic hydrocarbons on tumorgenicity?

A. I'm not aware that phenol does but it may. You are now into an area of which I know very little.

Q. Is it true that at certain temperatures phenols convert to phenones?

A. I have no idea what a phenone is.

Q. Have you ever heard that phenols are co-carcinogens?

MR NUNLEY: Are what? Excuse me.

MISS BRACHTL: Co-carcinogens.

THE WITNESS: I simply honestly

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don't know. I'm not aware.
BY MISS BRACHTL: The question is whether you have heard it?
A. I don't know.
MR NUNLEY: I think really what she's asking is do you have any recollection of ever having heard that.
THE WITNESS: No, I don't. I know some phenolix but as for phenol itself I'm not aware.
BY MISS BRACHTL:
Q. Well. Have you ever heard that phenolix are carcinogenous?
A. No.
Q. Or have you heard that phenolix are tumorigenous?
A. No.
Q. Have you heard that phenolix cause disease?
A. No.
Q. You have testified, I believe, that one component of TSNA is NNK -- right?
A. Yes.
Q. Excuse me if I've asked you this before. And NNK is a carcinogen, is that right?

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MR NUNLEY: Species, please.
MISS BRACHTL: What did you say?
MR NUNLEY: Species, please.
MISS BRACHTL: Oh.
MR NUNLEY: Which species?
BY MISS BRACHTL:
Q. You can answer?
A. NNK has been shown to be carcinogenic in animals.
Q. Did there come a time when you heard that NNK is produced in sidestream smoke?
A. Yes.
Q. When did you first hear that?
A. Early 80s. I don't remember exactly.
MR NUNLEY: Counsel you said produced in sidestream smoke. Do you mean present in sidestream smoke or produced?
MISS BRACHTL: Present. Thank you.
BY MISS BRACHTL:
Q. It's true, is it not, that NNK is present--
MR NUNLEY: The witness has indicated he would like to take a break.
MISS BRACHTL: We can certainly do that.

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Off the record at 4.07 p.m.

On the record at 4.17 p.m.

EXAMINATION:

By MISS BRACHTL: (Continued)

Q. Did there come a time when you learned that NNK is emitted in sidestream smoke even after the smoker stops smoking?

A. If I can ask you to repeat that or rephrase it perhaps?

Q. I'll certainly try. Did there come a time when you learned that NNK is emitted from cigarettes even after the smoker stops smoking?

MR NUNLEY: Objection as to form. I'm not sure I understand either.

BY MISS BRACHTL:

Q. Let me try it again. Are you familiar, or have you ever heard of a phenomena where a smoker smokes a cigarette, puts the butt in the ashtray, walks out of the room, NNK continues to be produced?

MR NUNLEY: You mean is the cigarette out, are you saying, smouldering, I don't know.

MISS BRACHTL: Whatever. Not doused with water, but smouldering.

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MR NUNLEY: So it's still producing smoke into the air.

THE WITNESS: That question still isn't precise enough to be answered.

BY MISS BRACHTL:

Q. Can you try?

A. I don't know under those conditions what would happen to NNK.

Q. Have you ever heard that NNK is produced from a cigarette for several hours after the cigarette is smoked?

A. Yes.

Q. Okay. Let me show you a document that we have marked as exhibit 12. Take a look at it. I'm going to ask you a couple of questions about it. I'm going to start with have you ever seen it and I'm going to ask you questions about that chart on the second page of the document.

MR NUNLEY: While he is looking at that, let me just say something and maybe I can make my concern more apparent. I take it, Jonathan, this is another one of the documents that has come to you by means other than production?

MR SHUB: Other than from Philip

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Morris.

MR NUNLEY: Okay.

MR SHUB: That doesn't mean it hasn't been produced.

MR NUNLEY: All I'm wondering is, looking at this document I don't know when it was produced if it had any type of confidentiality designation or not on it. Do you understand that if it had a confidentiality designation that when it was recopied that would have been captured.

MR SHUB: I believe, Chip, that if it had a confidentiality stamp on it, when it was copied it would have been captured.

MR NUNLEY: Okay. Thank you.

MR SHUB: In other words, there is no reason for me to believe that we redacted it in anyway. I can represent we didn't redact it. I can't represent--

MR NUNLEY: As it came to you.

MR SHUB: Right.

MISS BRACHTL: Counsel, if you're concerned about any documents, please feel free to call them confidential until you can determine whether or not they are.

MR NUNLEY: Okay.

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BY MISS BRACHTL:

Q. Dr Sanders, have you ever seen this document before?

A. I don't remember specifically seeing it.

Q. Let's look at the chart on the second page. It seems to reflect, and in fact it's labelled, "NNK concentrations in aging sidestream smoke of 8 commercial brands."

Would you agree with me this chart seems to indicate that NNK concentrations in smoke, at least in the cigarettes tested here, increased over time?

A. Yes, I would agree with that.

Q. Does that reflect research that you understand was done either by or at the behest of Philip Morris?

A. Yes, it does.

Q. Am I correct in understanding that if a smoker smoked a cigarette, stubbed it out, walked out of the room, NNK would be continue to be produced even though the smoker did not continue to puff on that cigarette?

MR NUNLEY: Objection. You are now positing something outside the research area, in a home or whatever. You need to ask whether these

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results were based on research or whatever, you know. Well, I leave it at that, but I think extrapolating from this table to outside the research or lab maybe inappropriate. On that basis I'd object, until you've laid the appropriate foundation.

BY MISS BRACHTL:

Q. You can answer the question.

A. I could not answer your question. Based on this table I could not answer your question--

Q. Okay, let's--

A. Whether, for instance, if I chose to smoke a cigarette in this room, I stubbed the cigarette out and I left, whether NNK would continue to form in this room. I'm not sure that it would.

Q. Are you aware of research done either by or at the behest of Philip Morris that indicates that NNK is produced for several hours after a cigarette ceases being smoked, under any conditions?

A. In conditions in a relatively small space with many cigarettes, that is conditions of very high concentration of smoke, yes.

Q. Was that research done at FTR?

A. Yes, it was.

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Q. Do you have any reason to think that those results would not be duplicated if you were to have a cigarette in this room?

A. Yes, I do.

Q. Why is that?

A. Because the reaction is very much concentration dependent, particularly since it's a as second order reaction. What will take place--

MR NUNLEY: For the jury, can you explain what a second order reaction is?

THE WITNESS: A second order reaction is a reaction that requires the collision of two molecules for the reaction to take part. Therefore, the more dilute the smoke is the rate of reaction drops off very rapidly.

BY MISS BRACHTL:

Q. So in other words, let's change my hypothetical. If there were twenty of us sitting in this room smoking cigarettes, smoking cigarettes and we had a few cigarettes and we put them out and left the room, would it be more likely, in that circumstance, that NNK would continue to be produced after we left?

MR NUNLEY: Excuse me. Within your question you said "many of us in the room smoking

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cigarettes, smoking cigarettes" and then you said--

MISS BRACHTL: Okay, let me be more precise.

MR NUNLEY: I'm sorry. And then you said, "smoked a few cigarettes."

MISS BRACHTL: Okay. Thank you counsel. Let me be more precise.

BY MISS BRACHTL:

Q. Let's change my hypothetical. Let's assume that twenty people were in a room smaller than this and in a one hour period each of those twenty people smoked four cigarettes and stubbed them out in an ashtray, then all of the people left the room, would NNK continue to be produced after the people left the room?

MR NUNLEY: Can you be more specific about -- you said smaller than this. I mean do you want to give the jury an approximation of size? I think that's important.

MISS BRACHTL: Thank you.

BY MISS BRACHTL:

Q. Let's assume that twenty people are sitting in a room that was 15 feet by 30 feet with a ceiling 7 feet tall, can you answer my

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hypothetical?

MR NUNLEY: Have you been in any rooms lately that had a 7 foot tall ceiling? Excuse me.

THE WITNESS: I need more pieces of information. What's the air exchange rate in the room?

BY MISS BRACHTL:

Q. That I don't know. Say normal air exchange rate?

A. It probably would not happen.

Q. Okay.

MR NUNLEY: Normal air exchange rate being like this room?

THE WITNESS: With about three to four air exchanges per hour.

MR NUNLEY: And that's normal?

THE WITNESS: That would be normal.

BY MISS BRACHTL:

Q. Are you aware of research done by Philip Morris to attempt to reduce the visibility of sidestream smoke?

A. Yes.

Q. Tell me about that, would you?

MR NUNLEY: Objection as to form.

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THE WITNESS: Starting probably in about 1982 Philip Morris had a program looking at the use of various types of cigarette paper which could be used to reduce the visibility of sidestream smoke.

BY MISS BRACHTL:

Q. Was Philip Morris successful in finding a type of paper that reduced the visibility in sidestream smoke?

A. Yes, they were.

Q. And did Philip Morris use that paper commercially?

A. Yes, they did.

Q. Beginning when?

A. 1990 or 91.

Q. And beginning in 1990 or 91 did Philip Morris use that kind of paper in all of its cigarettes that it sold commercially?

A. No, it did not.

Q. In half of them?

A. No.

Q. In some smaller percent?

A. Yes.

Q. Am I correct in thinking that in those cigarettes where the type of paper that

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you're describing was used a person could be exposed to NNK from sidestream smoke but not be aware that they were being exposed to it? Strike that. Am I correct in thinking that--

MR NUNLEY: Counsel, I apologize for interrupting you, but as I understand it the Arch case relates to smokers.

MR SHUB: Yes.

MR NUNLEY: Your case relates to persons addicted?

MISS BRACHTL: That is certainly what my case relates to, yes.

MR NUNLEY: As I said earlier, I'm not going to stop your inquiry but as directed at smokers in Arch, as to addiction in your case, I'm not sure what the relevance of this is. I'm not going to stop it, but this is your time.

MR SHUB: Of what, sidestream smoke?

MISS BRACHTL: I'm asking this in Arch.

MR SHUB: Okay. Just go ahead. Fine you object to relevancy.

BY MISS BRACHTL:

Q. Did the paper that you're talking

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about make sidestream smoke invisible?
A. No.
Q. Did it make it less visible?
A. Yes.
Q. What's the name of that paper?
A. Oh the paper has no name, it has a number.
Q. What's the number?
A. I don't remember it any more. Kimberly Park number blah, blah, blah. Or it has been called reduced sidestream paper.
Q. Did cigarettes commercially marketed by Philip Morris contain pyridine?
A. Cigarettes?
Q. Yes.
A. I'm not aware, but I wouldn't want to say no.
Q. Is pyridine toxic?
A. At very high levels.
Q. Pyridine is a CNS depressant, right?
A. I don't know.
Q. Pyridine causes liver and kidney damage when ingested, right?
A. I don't know.
Q. Okay. I understand I'm going to

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run out of time. I need to get some documents marked so I'm going to show you documents and ask if you've seen them. Let's start with exhibit 13. Look at it as much as you want or need to, to answer my questions. In the interests of moving right along I'm going to ask you some questions. Have you seen this before?

MR NUNLEY: I want to accommodate you in terms of moving along. Can you identify the document or are you going to go into it?

MISS BRACHTL: How about if we proceed if I go into it you can ask him to read it, okay?

MR NUNLEY: Could I just look at it a little bit more.

MISS BRACHTL: Okay.

MR NUNLEY: So all you'd like him to do at this point is look at it--

MISS BRACHTL: Just identify it.

MR NUNLEY: --to determine whether he can identify it, has he seen it before.

THE WITNESS: Yes, I have seen this document.

BY MISS BRACHTL:

Q. This is an annual report. Correct?

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A. That's correct.

Q. You have told us earlier about annual reports?

A. I'm not sure that I did.

Q. Okay. Is this your signature here, "approved by Edward B Sanders"?

A. Yes, it is.

Q. In the upper righthand corner we have an "accession number". What is that?

A. That is the central file filing number.

Q. Do you know what the policy is on document retention or destruction at central files?

A. No, I do not.

Q. And this says that charge and title number is 2500. What does that mean?

A. At that time in Philip Morris each project had a number which had originally been a billing number but even after that system was dropped, for many years that was the identification number of the project.

Q. Okay, so project number 2500 was "Synthesis of Tobacco Additives". Am I right?

A. Yes, that is the correct title.

Q. Before you approved this did you

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read it?
A. Yes.
Q. Does your signature here mean that you approved the contents and agreed with them?
MR NUNLEY: At that time.
BY MISS BRACHTL:
Q. At that time?
A. Yes, I think that's a fair statement.
Q. Thank you. I'm going to ask you about some compounds and for each of them I'm going to ask you whether you know whether it was used commercially in Philip Morris cigarettes and a couple of other questions. WS 14, have you heard of that?
A. Yes.
Q. And that's a menthol analogue, right?
A. Yes.
Q. And it was synthesized by Philip Morris, right?
A. No.
Q. Or synthesized by someone else?
A. Yes.
Q. By whom?
A. It was originally synthesized by Wilkinson

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Sword and patented by Wilkinson Sword and it was synthesized at Philip Morris's request by a company called Alpine Aromatics.

Q. And it was used in Philip Morris cigarettes?

MR NUNLEY: Objection. You mean in some as opposed to all?

MISS BRACHTL: Thank you.

THE WITNESS: It was used in a new brand that was test marketed and then withdrawn.

BY MISS BRACHTL:

Q. Okay. Did you have any involvement with WS14?

A. A little.

Q. What was your involvement?

A. My involvement was in assisting the synthesis of WS14 can with a C14 label for use in toxicology evaluation.

Q. Does WS14 have pharmacological effects?

A. Not to my knowledge.

Q. Was it tested to determine whether or not it has pharmacological effects?

A. Some, yes.

Q. Was that testing conclusive?

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MR NUNLEY: Objection as to form.

THE WITNESS: It is difficult to say that any testing is ever conclusive. It was very thorough.

BY MISS BRACHTL:

Q. Okay. I thought you just said that to your knowledge WS14 does not have pharmacological effects. Is that what you said?

A. Yes.

Q. I don't understand your answer. Is it that you don't know if it has pharmacological effects of that the testing showed that it did not have pharmacological effects?

A. The testing showed that it did not have pharmacological effects.

Q. Thank you. Is it toxic?

A. No.

Q. Was it tested for toxicity?

A. To my knowledge it was tested for toxicity.

Q. How about CR1719, do you know what that is?

A. I sure should. Yes, I think I know what that is.

Q. Is that something that was used in some cigarettes that Philip Morris sold?

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A. No.

Q. Was it used in some cigarettes that were given to people to smoke?

A. Yes.

Q. Is that compound pharmacologic?

A. I don't know.

Q. Was it tested to determine whether it was.

MR NUNLEY: Objection. I don't know what you mean by pharmacologic but it's your question.

THE WITNESS: If I remember correctly CR1719 was synthesized and evaluated before I came to Philip Morris. I don't think I can really do a good job of answering questions about that one.

BY MISS BRACHTL:

Q. Then I won't ask you any more. How about -- I might mispronounce this -- guiacyl [beta]-D-glucopyraniside. Are you very familiar with that?

A. You did a very good job, yes.

Q. Is that something that was included in cigarettes that Philip Morris sold?

A. No.

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Q. Was that included in cigarettes that were given to people to smoke?
A. No.
Q. How about P-cresyl [beta]-D-glucopyrasinide?
A. Pyraniside.
Q. Are you familiar with that?
A. Yes.
Q. Was that included in cigarettes that Philip Morris sold?
A. No.
Q. Was it in cigarettes that Philip Morris gave to people to smoke?
A. No.
Q. Thyml [beta] D-glucopyrasunoid?
A. Pyraniside.
Q. Pyraniside. Was that in cigarettes that Philip Morris sold.
A. No.
Q. In cigarettes that Philip Morris gave to people tie people to smoke.
A. No.
Q. How about poly isopropenyl menthl carbonate. Is that something that was included in cigarettes Philip Morris sold?

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A. No.
Q. Was that in cigarettes that Philip Morris gave people to smoke?
A. Yes.
Q. That's a compound?
A. Yes.
Q. And to whom was it given?
A. It was--
MR NUNLEY: Objection. Do you mean--
BY MISS BRACHTL:
Q. To whom were the cigarettes containing that compound given?
A. It was turned over to the flavor development department for evaluation and it was smoked by a number of internal panels.
Q. Does that compound have pharmacological effects?
A. No pharmacological effects were found in the testing.
Q. Is it toxic?
A. No, it is not.
Q. So it's not carcinogenic?
A. No, it is not.
Q. How about poly isopropenyl acetate,

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is that a compound that was contained in cigarettes Philip Morris sells or has ever sold?

A. Poly isopropenyl acetate; no, it was not.

Q. Was that given to people to smoke?

A. Yes, it was.

Q. Was that under test panel conditions?

A. Yes, it was.

Q. Is that a pharmacologic substance?

A. No.

Q. Is it toxic?

A. No, it is not.

Q. Was it tested for safety?

A. Yes, it was.

Q. Why were these compounds being -- strike that. The compounds that I've talked about, were they being investigated by Philip Morris?

A. Yes.

Q. For what purpose?

MR NUNLEY: Objection. That would be a compound question.

MISS BRACHTL: Do you want me to break it down as to each one?

MR NUNLEY: I'm telling you I object because it's compound. What you do with

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it is your decision.

BY MISS BRACHTL:

Q. In the interests of time, if you can try and -- were are all of the compounds that we've discussed being evaluated for the same purpose?

MR NUNLEY: Same objection.

THE WITNESS: The compound that you mentioned first, WS14, does not belong in that category.

Q. Okay, excluding WS14, were the other compounds that we've discussed being investigated for roughly the same purpose?

A. Yes.

Q. What purpose was that?

A. These were compounds that we called flavor release. They were derivatives of volatile flavors that were reacted with another compound to make them nonvolatile. When added to the cigarette they would decompose when the cigarette was burned and released the flavor.

Q. Did anyone ever tell you to destroy any documents at Philip Morris?

A. No.

Q. Are you aware of anyone being told

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to destroy documents?
A. I have heard in one or two cases that that may have happened.
Q. Tell me, please, what you heard?
A. I heard there was a document dealing with certain aspects of pesticide testing that someone asked to have it recollected and reissued, and I heard another one and I don't remember what it was.
Q. Nicotine is sometimes used as a pesticide, isn't?
A. Not any more.
Q. But it has been, correct?
A. It has been many years ago.
Q. Do you know whether the document that you're talking about had anything to do with nicotine?
A. I'm fairly certain it did not.
Q. Okay. Did you had ever see that document?
A. No, I never did.
Q. When is it that you heard that there was some discussion of returning that document?
A. Oh, actually relatively recently.

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Q. Within the past year?
A. Within the past two years.
Q. Okay, and my question was when you heard of it. Now let me ask you what is your understanding of when that direction was given?
MR NUNLEY: Well, objection. When you ask him about hearsay; now you're asking him whether the direction was given.
MISS BRACHTL: Fine.
MR NUNLEY: You converting hearsay to fact and I object to that.
BY MISS BRACHTL:
Q. Okay, let me rephrase the question. Did you hear anything about when that direction was given?
A. No.
Q. Did you hear anything about who gave the direction?
A. No.
Q. Did hear anything about who received the direction?
A. No.
Q. Did you hear anything about geographically where that direction was given?
A. It was in Richmond.

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Q. And did you hear anything about the--

MR NUNLEY: Same objection. I mean again you're talking about -- your questions go to -- you're nodding your head -- they go to what he heard not to the underlying facts or anything. Is that correct?

MISS BRACHTL: That's is correct, absolutely.

BY MISS BRACHTL:

Q. Did anyone ever suggest that you not finish research?

A. No.

Q. Did anyone ever reject a research proposal that you made?

A. Yes.

Q. More than once?

A. Yes.

Q. What were the research topics that were rejected that you proposed?

A. There was a topic involving the synthesis of terpenes. There was a topic, oh, that was the biggy. There was a topic dealing with biotechnological synthesis of flavors. There was a topic -- I can't remember them all but there have

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been a few.

Q. We've talked about papers that you have submitted for publication. Has there ever been a policy at Philip Morris that requires you to submit your papers that you want to submit for publication to anyone to review?

A. Yes.

Q. To whom must you submit your proposed publications?

A. The Manuscript Review Board.

Q. Has anyone ever edited, other than for typographical purposes, papers that you have proposed to submit for publication?

A. The Manuscript Review Board consists of a group of scientists who look at the paper for scientific content, and on occasions my papers have been critiqued properly for errors that I have made and I have changed those to be essentially scientifically correct.

Q. I'm going to ask you a question now and I want you to exclude from your answer any dealings that you have had with your counsel in connection with this litigation.

Have you had any involvement with lawyers during your employ at Philip Morris?

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MR NUNLEY: Objection. How do you mean? Can you be more specific?

BY MISS BRACHTL:

Q. Go ahead and answer?

A. Yes.

Q. Tell me about that, please?

MR NUNLEY: Same objection, this time as to form.

THE WITNESS: I have been, particularly during the last two and a half years, asked to advise some of our lawyers regarding, you know, scientific matters.

BY MISS BRACHTL:

Q. And have you done so?

A. Yes.

Q. What lawyers have you advised about scientific matters?

A. Some of the lawyers at Shook Hardy and Bacon, Covington & Burling.

Q. Who at Shook Hardy have you advised on scientific matters?

A. Primarily Leo Dryer and Tony Andrade.

Q. Anyone else.

Q. There are one or two others that were occasionally -- Bernie O'Neill would be

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another one.

Q. And what scientific matters have you advised them about?

MR NUNLEY: Objection. I think that goes to matters covered by the attorney/client privilege. Are you asking about the content?

MISS BRACHTL: Uh hum, I am.

MR SHUB: I think the topic is fair game.

MR NUNLEY: I disagree. I think anything within the context of the communication is privileged. Certainly the topic is within the context of the communication.

MISS BRACHTL: Let me do some groundwork here.

BY MISS BRACHTL:

Q. Were you advising them in connection with litigation?

A. No.

Q. What was the purpose for which you were advising them?

A. Em--

Q. You can answer the question.

MR NUNLEY: Excuse me. (Pause).

MISS BRACHTL: You can answer the

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question.

MR SHUB: Chip that--

MISS BRACHTL: Wait.

MR NUNLEY: I'd object on basis of foundation. My concern is this, Marta.

MISS BRACHTL: Martis.

MR NUNLEY: Martis. Thank you. If he knows the answer to your question because the lawyers came to him and said,"I'd like to consult with you on X for this purpose," then that's a privileged communication.

MISS BRACHTL: I think not. I think it's not privileged unless he was seeking legal advice or it was in connection with litigation. We know that it's not in connection with litigation. Let me ask some more groundwork questions. Let me ask some more--

MR NUNLEY: Excuse me. No. That would be work product privilege.

MISS BRACHTL: What would be work product privilege?

MR NUNLEY: If it were done in connection with litigation; it can still be attorney/client privilege if it's done outside--

MISS BRACHTL: Let me ask some

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questions to establish that, okay.

MR NUNLEY: You can ask the questions but I--

MISS BRACHTL: Thank you.

BY MISS BRACHTL:

Q. You weren't seeking legal advice from these attorneys when you advised them, were you?

A. No.

MR NUNLEY: "You" meaning -- excuse me. "You" meaning you Mr--

MISS BRACHTL: Him personally, right.

BY MISS BRACHTL:

Q. You personally. Right. Was your -- do you know the broad purpose for which these lawyers were seeking your advice?

MR NUNLEY: Just a second. (Pause) If you know that purpose only because of something a lawyer has told you, then if you know the purpose through what the lawyers told you then you don't need to include that in your answer.

MISS BRACHTL: That's wrong. Are you directing him not to answer in that respect?

MR NUNLEY: Why is that wrong?

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MISS BRACHTL: Because let's assume the lawyer said, "I want you to give me some advice so I know how to rob a bank." That would be covered within your statement as to what he need not answer to but it's not privileged. It's only privileged if it's in connection with rendition of with legal advice. So I think he can answer the question about the purpose for which he was being consulted.

MR NUNLEY: If it were for other than the rendition of legal advice.

MISS BRACHTL: No, I think that's incorrect.

MR NUNLEY: That's what you just said.

MISS BRACHTL: Let's go off the record and let's you and I go outside and talk, okay.

MR NUNLEY: Sure.

Off the record at 4.48 p.m.

On the record at 4.52 p.m.

EXAMINATION:

BY MISS BRACHTL: (Continued)

Q. Dr Sanders just now before we went back on the record your attorney whispered

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something in your ear, right?

A. Yes.

Q. Did he whisper something about the pending questions to you?

MR NUNLEY: Objection. Don't answer the question.

MISS BRACHTL: I absolutely want an answer to this question. The law in several jurisdictions, including mine, is that if during a break counsel, rather than the witness, initiates a discussion, I'm entitled to ask what it's about. He did not initiate the discussion. There is a problem here about attorney/client privilege. We went in the hall. We had a discussion. You came back and said something to him. He didn't ask you. I'm entitled to find our what you said to him. (To the witness:) Please tell me.

MR NUNLEY: Let me tell you, we're doing a deposition that started at 10 because you asked to start it at 10. We could have started earlier. We were prepared to take as attenuated a lunch break as you wanted to take, and indeed offered to take a 30 minute one and you wanted longer. We've had several stops for you to organize documents. You've now gotten into an

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area of attorney/client privilege, which we broke and went outside. You attenuated my ability; how am I supposed to know to defend the privilege if I can't communicate with the witness. When I leaned over to say something to him the purpose was to try to find out whether or not a privilege attached to this.

Now, I didn't call him out in the hall because you're trying to finish by 5 o'clock because this witness has a flight, as you know. So I'm not going to let him answer this question and if you want to preserve on it, you can preserve on it.

MISS BRACHTL: I do. So you're directing him not to answer that question?

MR NUNLEY: Correct.

BY MISS BRACHTL:

Q. You've talked about discussions that you've had with lawyers at Shook Hardy?

A. Yes.

Q. Without telling me the content of the discussions, I would like to know when you've had them?

A. Several times during the period between 1995 and 1996 while I was in Richmond.

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Q. Okay. Did you have face to face meetings with these attorneys?
A. Can you?
Q. Yes, face to face means face to -- I'm sorry what don't you understand?
A. I had meetings in groups with large numbers of other people present as well, as opposed to individual meetings with an attorney or attorneys.
Q. Okay. Were the other people who were present Philip Morris employees?
A. Not necessarily.
Q. Who else was present other than Philip Morris employees or Shook Hardy employees?
A. Certain consultants.
Q. Tell me who they were?
A. One was -- oh I can't remember his name, a toxicologist who's a consultant for Shook Hardy and Bacon and I don't, right now I've forgotten his name. And the other one was a representative from a group called Washtec, Washington Technical Group.
Q. How many people where there from Washtec?
A. Anywhere from one to three.
Q. Were there any other people present

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at these meetings other than the toxicological consultant and the Washtec people?

A. Not that I remember, no.

Q. And how many such meetings did you attend?

MR NUNLEY: When you say, "how many such," you mean with that same group of participants?

BY MISS BRACHTL:

Q. Well, how many meetings with Shook Hardy Attorneys did you attend in this time frame?

A. Probably I would guess around four.

Q. Okay. And how long did the meetings last? I guess you'll have to tell me each one?

A. Generally, most of them one day. There was one that was two days.

Q. So one of the meetings lasted for two days and two of the meetings lasted for one day each, no, three meetings lasted for one day, is that right?

A. Yes, that's approximately right.

Q. Can you tell me what was discussed at the meetings?

MR NUNLEY: I object to that.

MISS BRACHTL: Are you directing

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him not to answer?

MR NUNLEY: Yes, I am.

MISS BRACHTL: Counsel, we have non-lawyers present and I believe that that's a waiver.

MR NUNLEY: Are you telling me, Miss Braxton (sic), that you've been involved in litigation before, or in advising clients on matters, where you've retained consultants, had them at the meetings, and you believe that that waives the attorney/client privilege?

MISS BRACHTL: I think it can, yes. Are you directing him not to answer?

MR NUNLEY: Yes, I am.

MISS BRACHTL: Okay.

BY MISS BRACHTL:

Q. Were any documents given to you at any of those meetings?

A. I can't think of any. I couldn't swear no, but I can't think of any.

Q. Did you make notes at any of the meetings?

A. No.

Q. Okay. What was your understanding as to the role that the consultants were playing

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at the meetings?
A. They were also advising regarding technical -- they were providing technical expertise.
Q. Do you know whether they were consultants to Philip Morris?
A. The one whose name I've forgotten is clearly not a consultant for Philip Morris. The other could have been a consultant for Philip Morris on other matters, but not on that particular issue.
Q. Do you know to whom the toxicologist was a consultant?
A. Yes. He was a consultant to Shook Hardy.
Q. Okay. And the Washington tech person?
A. I think they were to Shook Hardy as well, though I'm not absolutely certain of that.
Q. Did you think that these meetings were held in conjunction with rendition to Philip Morris of legal advice?
MR NUNLEY: I object. One, I think that calls for a legal conclusion: two, I'm concerned that answering that question, for reasons I've told you before, may invade the attorney/client privilege.

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BY MISS BRACHTL:

Q. Did you have any understanding as to whether the purpose of those meetings was to assist in rendering legal advice to Philip Morris?

MR NUNLEY: I'll let him answer that question.

MISS BRACHTL: Thank you.

THE WITNESS: That was my understanding, yes.

BY MISS BRACHTL:

Q. Thank you. Now that you are living here at the end of your being in Switzerland do you--

MR NUNLEY: For the record. He lives in Switzerland and we're present here today in England.

BY MISS BRACHTL:

Q. Do you ever travel to the United States?

A. Sometimes.

Q. Do you go to Richmond?

A. Sometimes.

Q. How often?

A. Probably about three or four times a year.

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Q. Do you go there on business?
A. Yes.
Q. Regularly?
A. About three or four times a year.
Q. Thank you. Let's see if we can mark a few documents in our remaining time. All I'm going to do is show them to you and ask you if they are indeed from you, ask you if you've seen them before.
MR NUNLEY: I would note that at least by my watch it's 5.02; by the clock on the wall it's 5.03.
MISS BRACHTL: Counsel, you need to finish when?
MR NUNLEY: I told you that he has a car at seven. To try to accommodate you--
THE WITNESS: A 'plane.
MR NUNLEY: He's got a'plane at seven. I have car coming at 5.15. He's got to catch a train that takes half an hour to get to the airport. It's an international flight. So running at 5.15 is pushing it close, plus I've told you I've got five minutes of cross-examination.
MISS BRACHTL: Counsel, I don't

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know how you can cross when I haven't finished my direct. So my question to you is how long may I go?

MR NUNLEY: You may go to ten after five and then I have five minutes of cross.

MISS BRACHTL: You can't cross unless I finish my direct. I'm not going to finish my direct.

MR NUNLEY: Well that's your problem, that is your problem, a problem that you created.

MISS BRACHTL: Counsel, I've -- well, I'll tell you counsel the reason we were late is the witness was -- I don't want to get into a big fighting match with you but--

MR NUNLEY: The witness was not late.

MISS BRACHTL: Well, when the witness got here you marched him outside for 15 minutes, so I just object to--

MR NUNLEY: You weren't even--

MISS BRACHTL: I have been here since 9.30, so let's not--

MR NUNLEY: Excuse me--

MISS BRACHTL: --fight with each

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other about--

MR NUNLEY: No, no, I'm not going to fight with you but I'm going to correct the record. He sat in this chair for about 15 minutes before the deposition began while certain document issues and technical problems were straightened out. I don't want there to be any indication that the witness arrived late and delayed this deposition.

MISS BRACHTL: There was some delay because you took the witness outside. There was some delay because the videographer had problems. If we can proceed instead of doing this that would probably be a real good idea.

MR NUNLEY: We can proceed but I'm going to take my cross and the deposition will close when we leave today.

MISS BRACHTL: You cannot cross him until I finish directing him, so I don't know how you're going to cross.

BY MISS BRACHTL:

Q. Okay. Let me show you what we've marked exhibit number 14. It is an August 12, 1980 memo from Dr Osdene to Dr Seligman and others. You are cc'd on it. Have you seen it before?

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A. Yes, I remember this.

Q. Thank you. Look now at what we have marked Sanders exhibit 16. This is an annual report on "Biochemical Special Investigations" dated March 24, 1986. Is this your signature on it, on the first page?

A. Yes.

Q. And does that signature indicate that you approved it?

A. Yes, it does.

Q. Thank you. Let me show you what we've marked as exhibit number 15 which appears to be a memo dated May 30, 1989, from you to Dr Houghton. Did you author this memo?

A. Yes, I did.

Q. Was the information in it correct at the time that you wrote it?

MR NUNLEY: Objec -- well, I mean understand your time but you're not even giving him a chance to look at the document.

BY MISS BRACHTL:

Q. If you know.

MR NUNLEY: I note it's dated 1989.

BY MISS BRACHTL:

Q. Let me withdraw that question and

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ask, do you have any reason to think that the information in here wasn't correct when you wrote it?

A. Not to the best of my knowledge at the time.

Q. Okay. Let me show what we've marked exhibit number 17. You are indicated as a cc recipient on this document. Do you recall receiving it at about the time it was written?

A. I'm sorry, but this one I need to look at. (Pause) Yes. I remember receiving it.

Q. You do recall receiving it?

A. Yes.

Q. Thank you. One final document doctor which we've marked exhibit number 18. It appears to be a memo from Dr Seeman to you dated January 4, 1980. Do you recall receiving this?

A. I wouldn't recall receiving this specific memo. There were too many that were similar.

Q. Okay, do you have any reason to think you did not receive it?

A. No. I have no reason to think I did not receive it.

Q. Thank you. I would like to mark one more exhibit. This is a notice of your deposition

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in this matter. Have you seen it?

A. No.

Q. It calls for you to produce some documents. Have you brought any documents with you today?

A. No.

MISS BRACHTL: Counsel I was advised by New York counsel for Philip Morris a few days or a week or so ago that Philip Morris would not be able to gather the documents requested in that process in time for the deposition. I asked for whatever documents could be gathered, would be. I told counsel that in the event the documents were not produced I would state at the deposition that it would be my intention to complete the deposition upon receiving those documents. I understand we are out of time and I will intend to continue the deposition when I receive the documents we've sought.

MR NUNLEY: Let me respond to that. This is a matter we took up before the deposition started, so it's a matter that you've taken the deposition subject to having known what our position was as I told that as I understand it

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under the New York laws of civil procedure or whatever--

MISS BRACHTL: CPR.

MR NUNLEY: -- they refer to in New York, notice of an oral deposition is to be given 20 days before the deposition is taken. I think that's covered by 3107 and 3120, as I understand it, calls for notice calling for the production of documents to be given 20 days in advance of the date they're due.

This deposition had been noticed in the Arch case for some time. The document you handed Dr Sanders which is marked as Sanders 19 is dated August 7, a week before this deposition. I would state further that at Philip Morris's -- it has been Philip Morris's efforts to bring Dr Sanders to London for the deposition. I would state further that Philip Morris cooperated by having its counsel in the Arch case make office space available in London for this deposition, as far as I know, offered to have court reporters available. The deposition started at 10. That's when the Plaintiffs wanted it to start. It could have started earlier. I disagree strenuously with the idea that it was delayed in any way by the

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witness being late. The witness was here on time and we waited to start on your behalf. At lunch we had offered to cut lunch short. We offered to come back at 2.45, you said no, come back at 3. We were back at 3, we didn't start until 3.15.

So everything that's happened here today, you've decided to do it in that fashion. So it's our position that you've finished your direct. I have some cross-examination I'd like to do of this witness and I'm prepared to do it and do it in the remaining four minutes.

MISS BRACHTL: No. I have not finished my direct. I am not going to have your cross-examination. Thank you so much. You have been very hospitable in arranging space for us and producing the witness and we certainly appreciate that. Yes, it's true that I wanted to take 45 minutes rather than half an hour for lunch; I will certainly say that.

Had your New York Counsel told me that if I appeared at this deposition I would forego any right I might have to examine the witness on the documents, I certainly would not have come here. Actually we came here as an accommodation to the witness so he wouldn't have

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to be produced twice. So if we have more time, I'm going to continue with my questioning.

MR NUNLEY: On that point, I would say that, as I told you when we started, our position was that you're out of time on your notice. You've taken it with that knowledge. I think you've waived any right you have to say that the deposition continue.

Furthermore, I'll tell you if it's your position -- I'm not going sit here and try to shout over you in cross-examination, but if it's your position that you're not going to permit me to take my cross-examination I will tell you that it's going to be our position this deposition cannot be used in any manner in the litigation. It's going to be closed now and if you're going to close it without allowing me to take 4 minutes of cross, then our position before Judge Newcomer in the Arch case and before Judge Ramos, I believe it is, in the New York case, is that you prevented me from taking cross-examination I'm entitled to and because of that you've waived.

MISS BRACHTL: Counsel, I am not finished with my direct examination. I have a stack of documents here I haven't been through.

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I believe I am entitled to continue this deposition without waiving that position. If you will agree that I am not waiving my right to present that position I'll let you cross. I'm not saying you are agreeing with my position, I'm just saying that you need to agree that I'm not waiving my right to present that position and my position is that I haven't finished my direct. I have additional documents here.

MR NUNLEY: Well the record will speak for itself as to where we are.

CROSS-EXAMINATION:

BY MR NUNLEY:

Q. Dr Sanders, let me ask you to put Sanders 11, I believe it is, in front of you, and although I'm sitting immediately to your left, if you just face the jury in this cross-examination I have. First question. Miss Brachtl asked you several questions related to research in the biological activity. Do you recall that?

A. Yes, I do.

Q. Have you been involved directly in research into biological activity at Philip Morris?

A. Yes, I have.

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Q. In the years that you've worked at Philip Morris have you ever been involved in leaf blending?

A. No, I never have.

Q. Now Miss Brachtl asked you whether Philip Morris had ever disclosed to the public that polycyclic hydrocarbons were in smoke. Do you remember that?

A. Yes, I do.

Q. I think you testified that Philip Morris had published papers on that?

A. Yes, I did.

Q. And beyond the Philip Morris papers published on the subject, was it in any way secret that polycyclic hydrocarbons are contained in cigarette smoke?

A. Not at all.

MR SHUB: Objection.

BY MR NUNLEY:

Q. Was the fact of polycyclic hydrocarbons something that was known to the public?

A. I can't answer what was known to the public. I can state that there were numerous reports, both in the scientific and popular

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literature, talking about polycyclic aromatic hydrocarbons in smoke.

Q. Would that be also true for TSNA's, that there were numerous studies in the scientific literature indicating that TSNAs were present in smoke?

MR SHUB: Objection.

THE WITNESS: Certainly in the scientific literature, yes.

BY MR NUNLEY:

Q. Miss Brachtl asked you several questions based on the document Sanders 11 and certainly the questions related to blend composition, and she directed you to page 2024843568. Do you have that in front of you? That's the page. That's correct?

A. Oh, okay.

Q. Do you see the blend composition that's indicated at the top of that page?

A. Yes, I do.

Q. The low alkaloid Bright and low alkaloid Burley tobaccos, are those commercially available tobaccos?

A. No, they are not.

Q. Even assuming that instead of low

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alkaloid Bright or low alkaloid Burley, they were simply Bright and Burley, is that blend composition one that is representative of Philip Morris commercial projects?

MR SHUB: Objection.

BY MR NUNLEY:

Q. If you know?

A. As indicated, I don't have experience in leaf blending. My opinion would be no, but I'm not expert on the subject.

Q. I think she asked you whether TSNAs might be reduced if blends were changed to be comprised of Oriental and Bright. You remember that question?

A. Yes, I do.

Q. Are cigarettes that are sold in the United States comprised only of Oriental and Bright?

A. No.

MR SHUB: Objection.

BY MR NUNLEY:

Q. Do they include Burley tobacco -- cigarettes that are sold in the United States?

A. The vast majority of cigarettes sold in the United States would all include Burley tobacco.

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Q. Thank you. Do you have an opinion as to whether, based on your experience as a smoker, removing the Burley tobacco component from cigarettes, commercial cigarettes in the United States, would have an impact on the taste.

MR SHUB: Objection.

THE WITNESS: A very large impact on taste.

BY MR NUNLEY:

Q. The next page Miss Brachtl asked you about certain antioxidants. I'm sorry, next page over.

A. Okay, I've got it.

Q. Certain antioxidants that might be added to filler, and she asked about ascorbyl palmitate?

A. Uh hum.

Q. Do you know to get the results that are indicated on this page the amount of ascorbyl palmitate that needed to be added?

A. It was at least in the 5 percent range. It was a large amount.

Q. The next test cigarette indicates it was made of Burley and PrDHHC. Do you see that?

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A. Yes.

Q. Do you know how much PrDHHC was added for the test purpose?

A. Again, a large amount. At least 5 percent.

Q. Do you have an opinion as to what, if any, impact the addition of ascorbyl palmitate would have on taste?

MR SHUB: Objection.

THE WITNESS: It would certainly change the taste of the cigarette.

BY MR NUNLEY:

Q. Do you have any opinion as to the effect of the addition of PrDHHC at the levels used in this experiment might have on taste cigarette?

MR SHUB: Objection.

THE WITNESS: It would again certainly change the taste.

MR NUNLEY: Those are all the questions I have. Thank you very much. Again, Philip Morris's position is the deposition is now closed.

(The deposition was concluded at 5.15 p.m.)

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CERTIFICATE

I, ROBERT FREEMAN, Certified Shorthand Reporter, do hereby certify that the foregoing is a true and correct transcript of my original stenographic notes of the depositin of Dr EDWARD SANDERS.

Signed:

ROBERT E FREEMAN

On the 25th day of May, 1997

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JURAT

I DR EDWARD SANDERS, do hereby certify that I have read the foregoing transcript of my testimony, taken on August 15, 1997, and have signed it subject to the following changes:

PAGE	LINE	CORRECTION

Signed:

EDWARD SANDERS

DATE:

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